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PREDISPOSITIONS TO TUBERCULOSIS.*

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THE Koch bacillus is, of course, the specific cause of tuberculosis. It will, however, be referred to but incidentally in this paper, which is upon predispositions to that disease. I shall divide the subject rather roughly into three parts. First I shall consider certain hereditary factors; then such factors as prove pernicious in the period between conception and birth; and finally postnatal predispositions.

It is pertinent to the trend of this paper to repeat the much-quoted statement that life is the continuous adjustment of internal relations to external relations. This very inadequate definition nevertheless emphasizes the position in which the organism is placed with regard to its environment. And it is in this broad aspect that I am about to consider the effects of external phenomena upon the economy with reference to a disease which, according to autopsy reports, leaves its imprint, in greater or less degree, upon more than 90 per cent. of humankind.

And I shall not be content to examine only into such predispositions to tuberculosis as may obtain in the time between birth and old age. I shall recognize the tremendous importance of prenatal influence. Indeed, the divisions of this subject which I have made are purely arbitrary; for at conception older cellular elements are but transmuted into a new cellular combination; nor is birth more than another step in a series of life processes.

It is not merely a fancy of the romancer, but a statement saturated with practical sense, that the past lies upon the present like a dead giant's body, so that it is as if a young giant were compelled to waste all his strength in carrying about the corpse of an old, an atavistic giant. We sleep in dead men's houses, bacillus-ridden as they are; we are sick of dead men's diseases; we live in dead men's lives; as these sentiments are taken from a dead man's book. And it is equally true that future generations must inevitably be affected by the disposition, physical or otherwise, of the lives of individuals in the present.

With regard to heredity in general it would seem that one may assume almost any position, and will be able to set forth many unquestionable facts in support of the stand he takes. In considering the heredity of tuberculosis we come upon a wide range of positions, from that of the transmission of the disease itself, to the declaration

that tuberculous parents actually confer upon their offspring an immunity to the disease.

Since the demonstration of the Koch bacillus, and up to very recently, it has been generally agreed that only a tendency to the disease, a vulnerability, and not the disease itself, a soil predisposing the organism to tuberculosis, may be transmitted. These expressions are vague, from a scientific viewpoint, and it would be desirable if they could be made to express some definite condition.

There are certain signs by which this hereditary tendency to tuberculosis may be manifested. Chief among these is what I venture for the present to call the scrofulous temperament. The scrofulous child has a pallid skin and flabby flesh; there is often chronic blepharitis; phlyctenulæ are frequent; the nose is large and broad and acnestudded; there are nasopharyngeal adenoids and hypertrophied tonsils, so that these children are mouth-breathers, starved for oxygen. There are tedious inflammations of the mucous membranes—coryza, congested and unhealthy throats, and bronchitis exceedingly rebellious to treatment; there are persistent adenitis and periadenitis, the lymphatic glands becoming enlarged and remaining so. There is a sluggish, torpid metabolism. Altogether, there is evidence of a radical nutritive disturbance.

Besides struma, we find thoracic malformations, narrow chests, lacking also in depth, projecting shoulder-blades, and small respiratory muscles. There are emphysema and an evident capacity for breathing below the average. There is, again, defective development of the circulatory system, especially of the aorta; there are congenital heart-lesions, and the heart is small. There are anemia and chlorosis. Among other manifestations there are—slow teething and deficient ossification in children, infantilism, stunted growth, and defective genital development.

It is evident that among these signs of hereditary transmission some are of an anatomical sort, while others are functional in character. This is an important distinction from the viewpoint of practical therapeutics. For it is a well-defined law of heredity that functional rather than anatomical modifications are transmitted; at any rate the latter are consequent upon the former, the development of any organ being regulated by exercise of that organ.

Functional modifications may indeed be unaccompanied by anatomical stigmata; the former may be exaggerated through successive generations without giving a hint of their existence, until the stimulation of some exciting cause, as a traumatism or an intoxication, may bring them to light. Thus it is that many having seemingly vigorous frames nevertheless succumb to the on-

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set of the tubercle bacillus and its allied micro-organisms.

This fact should appeal to those who would claim, from an absence of demonstrable anatomical lesions, that there is no such thing as hereditary transmission. Tuberculous parents may not bequeath definite stigmata; nevertheless they often do impart a pernicious nutritive habit to their offspring. For instance, the latter may suffer because of insufficient respiratory activity. This would certainly occasion deficient oxygenation, so that there would result a lessened vigor of cell-regeneration and of connective-tissue formation, an imperfect metabolism, and the like—a condition of things pathological enough, yet in its incipency at least non-microbic—a condition non-infectious, but cordially inviting infection.

Moreover, in examining these indications of a transmitted vulnerability to tuberculosis it is worthy of note that many of them are distinctive also of other affections in which heredity plays a part, such as insanity, alcoholism and syphilis. Insanity and alcoholism, non-microbic affections, are often correlated with tuberculosis; and there are not a few analogous features between the latter and syphilis. The conclusion then would seem warranted that in all such affections, tuberculosis as well as the others, there is a like degenerated condition of the organs and tissues, which makes them fruitful soil for microbic germination.

When we come to consider the period between conception and birth we find that specific congenital infection by the Koch bacillus undoubtedly exists. Tubercles containing the bacillus have repeatedly been found in the stillborn. The bacillus has been found in the seminal vesicles in the male, in the female tubes, and in other tissues concerned in reproduction; the bacillus and its toxins have been found in the semen of infected animals. And a conclusive simile may be adduced from undoubted congenital infection in syphilis, smallpox, glanders, cholera and pneumonia.

Still, these infections are comparatively rare; Frebelius has found tuberculous lesions in but 416 out of 16,580 autopsies upon sucklings; and Ballantyne holds that the placenta acts excellently as a sifter to protect the fetus from infection. What is probably much more frequent is a susceptibility to infection in the tissues of the embryo and fetus. Here the parental condition at the time of conception is an important consideration. Roger cites a case of parents of uncommon strength, who had three children. The firstborn and the youngest were very well constituted and had inherited the strength of their parents; the second, conceived at the time when his father was convalescent from pneumonia, was poorly developed, remained feeble, and at the age of twelve years contracted tuberculosis, from which he died. Similar cases will occur to every practitioner. Bodily or psychic disorders in the parents, fatigue, convalescence after a serious

disease, advanced age at the time of conception, causes accidental, or perhaps so slight as to escape notice, or such as may be transitional in the parents, may induce a vicious nutrition, making the organism receptive to infection, tuberculous or otherwise.

During the embryonic period the cells become differentiated and the organs of the body are formed; during fetal life the organs thus formed increase in size and begin to take on their several functions. Throughout both these periods, but especially the former, the organism is most acutely sensitive to environmental impressions—to variations in oxygen supply, warmth, the chemical constitution of the maternal blood, uterine or placental diseases, and the like. When such influences are abnormal, it cannot be hoped that the tissues of the fetus will remain unaffected.

In coming to a consideration of postnatal predispositions, I will revert to certain aspects of struma—the pronounced sluggish metabolism; and the tendency to inflammation of mucous membranes and of lymph-glands, the respiratory membranes and the glands of the mesentery and the bronchi being marked sufferers.

Flick, Wright and others tell us that tuberculosis, a disease dependent beyond doubt upon the presence and the propagation of the Koch bacillus, is always, to begin with, a purely local affection. Tissues which have had their circulation disturbed by traumatism, vasomotor, functional or other disorders, become foci. The extension of the process then depends largely upon the spread of the bacillus from these diseased foci by means of the lymphatics and the blood-vessels. It is likely that the alimentary lymphatic channels are more active carriers than are those of the respiratory tract; and it is considered that the quality of the food ingested is of primary importance.

The idea that pulmonary tuberculosis comes about in the first instance through the inhalation of the Koch bacillus into the air-vesicles is considered erroneous. It is held that the bacillus cannot be inhaled because the function of the respiratory tract anatomically and physiologically is limited to the admission of gaseous substances only; that air is changed in the alveoli not by currents, but by the subtler influence of the law of the diffusion of gases. The main routes by which the lung tissues are invaded are then two: first by way of the alimentary canal, the course being the stomach, intestines, lacteals, thoracic duct, the vena cava, the right heart and the lung; the second route being by way of the bronchial glands to the thoracic duct, the vena cava, the right heart and finally the lung.

The pathologist has, in fact, found very little evidence of primary colonization of the Koch bacillus in the pulmonary parenchyma. There is abundant evidence of primary tuberculosis in the bronchial glands; but these are not, strictly speaking, parts of the lung parenchyma. However, in almost every part of the body, differing

in each individual according to his most vulnerable tissue, there is primary tuberculosis; in the lymphatics, serous and mucous membranes, skin, periosteum, in the intra-abdominal, intra-cranial and reproductive organs, in the nose, throat, ear, tonsils, mastoid and the eye. The place of deposit is not necessarily the point of entry of the parasite. There may be tissues which for many years have latently harbored colonies of bacilli, without setting up symptoms until the advent of some acute cause.

But how explain, then, the frequency of pulmonary tuberculosis, particularly in the apices? The first rib is frequently immovable, so that expansion is restricted; Schmorl has found a furrow running around the upper aspect of the apex, which he attributes to defective development of the first rib. He finds that the bronchial twigs which supply the neighboring parts of the lungs are often crooked, narrowed or otherwise deformed, so as to present a favorable situation for the persistence of catarrh in the mucous membrane. Then Esser points out that in children at least the inflamed bronchial glands often compress the bronchi and also the branches of the pulmonary artery, which supply the upper part of the lung. So that in the apical region there are lessened power of expansion, imperfect aeration and insufficient blood-supply. The pathology of cold is suggestive here; for tuberculosis frequently follows that condition. Cold will produce contraction of peripheral vessels, with pulmonary anemia, the blood being in most cases driven into the abdominal viscera. And anemic tissues present diminished resistance to infection, particularly when the Koch bacillus is the agent. Again the venous blood, bacillus-laden, from the thoracic duct, is first carried through the pulmonary circulation for oxidation before returning to the left heart. The lungs, therefore, bear the brunt of exposure to this infection, and act as a strainer to the general circulation.

The alimentary tract is, then, very intimately concerned in the spread of tuberculosis. It is to be emphasized here that in infants abdominal tuberculosis is more frequent than the pulmonary form; it is striking also that gastro-intestinal diseases are very prevalent in infancy and childhood, and that there is at this time much improper, or unsuitable, or artificial feeding. Carriere finds that in all cases of tuberculosis among children, 30 per cent. are of the lungs, 40 per cent. are of the peritoneum, and that tuberculous enteritis occurs in 20 per cent.; and declares, though too sweepingly, that the nutriment consumed furnishes the sole medium by which infection is accomplished. The germ is often taken in with the food, or from bacillus-laden things such as infants are in the habit of putting into their mouths. Tuberculous excreta from the upper air-passages are swallowed. In the stomach the germicidal properties of the gastric juice are encountered—an ineffectual safeguard, however. If digestion here is impaired or incomplete, the bacillus is

passed intact into the intestines; here unassimilated material including the bacilli must occasion intestinal hyperemia. Under these conditions peristalsis mixes the undigested bacilli with the chyle. Then the lacteals and the lymphatics take them up and carry them into the mesenteric glands and the thoracic duct. Those which reach the mesenteric glands are likely to colonize and be carried into the thoracic duct, whence they will reach the pulmonary circulation by way of the vena cava.

It is a pleasure to refer here to Sajous' work on the "Ductless Glands," a patient, altruistic work extending over a period of fourteen years, the first five of which, as he tells us, were spent in futile gropings about. Although this work has received the hearty appreciation of his colleagues, his findings have yet to meet their acceptance. I set down here only certain of his views concerning tuberculosis. Vulnerability to infection, he declares, means insufficiency of the adrenal system and lowered oxidation; when this insufficiency obtains, the functional activity of the spleen and the pancreas and the production of trypsin are correspondingly reduced. The digestive process within the neutrophile leucocytes, which collect foodstuffs in the intestinal canal, is due to the action of trypsin; a deficient supply of proteolytic ferment therefore reduces the efficiency of this process. The protection thus afforded the general system is reduced in proportion; since undigested bacilli are pathogenic bacilli. The path which these leucocytes follow is the villi, the portal system, the right heart and the pulmonary circulation. Thus infection of the lung can occur through bacilli taken up by leucocytes in the intestinal canal.

Sajous further considers that relationship between the adrenal system and the alkalinity of the blood is an important feature in the pathology of pulmonary tuberculosis. In this disease, he declares, there is an insufficiency of alkaline salts; that during the pretuberculous and in the earlier stages of tuberculosis there almost always occurs a very marked loss of mineral salts, "causing one to wonder whether this demineralization might not be one of the mysterious conditions which create the soil for a rapid pullulation of the tubercle bacillus." Trypsin will not act in the absence of salts; and this ferment, according to Metchnikoff, is the active body which in the phagocytic leucocytes destroys the bacilli.

A faulty metabolism plays an enormous part in predisposing the tissues to tuberculosis. The presence in the body of nitrogenous matters in a decomposing or readily decomposable state affords an ideal pabulum for the nourishment and development of micro-organisms and their toxins; and such factors as unwholesome food, bad water and foul air will further an excess of these effete matters in the tissues. Ordinarily such material is limited to the amount which is continually being excreted in the ordinary waste of the body; and if the excretory organs all combine in normal action, this is drawn off from the blood currents

as fast as it is poured into them; so, that the stream is kept clean. But if such decomposing matter be introduced abnormally from without, as in habitual infractions of hygienic laws, such as many who contract tuberculosis are addicted to; or if it be generated in abnormal quantities within the body; or if the normal process of elimination be in any way obstructed—a rapid accumulation will take place, so that there will be provided a fruitful soil for the growth of the bacilli and their toxins; more than this, there result ideal conditions for the development of mixed infections, in which the cocci join the bacilli, so that a curable disease often becomes transformed into a fatal one.

We have touched upon hereditary lesions of the heart and blood-vessels predisposing to tuberculosis. An impaired circulation means reduced oxidation, and consequently tissue starvation, particularly in the lungs; for under these conditions the vast capillary system opposes the already weakened cardiac contractions; and the pulmonary structures will not receive even their share of the deficient blood-supply. In this connection Sajous holds that such symptoms as pallor, muscular weakness, a thin, compressible pulse, an undeveloped or slightly dilated heart, anemia, anorexia, coldness of the extremities and habitual hypothermia, point to adrenal insufficiency. We may not agree with him as to the reason for these symptoms; but they do denote an ideal condition predisposing to tuberculous infection.

Chlorosis, an affection frequently related to tuberculosis, is referred variously to lesions of the vascular system, to adolescent disturbances, and to digestive disturbances; in each of these aspects is a relation logically established.

Alcohol certainly stands in a causative relation to tuberculosis. Pulmonary tuberculosis is almost invariably found in persons dying in the course of chronic alcoholism; tubercle of the peritoneum or pleura frequently accompanies cirrhosis; acute miliary tuberculosis finds alcoholics an easy prey. Kelynack finds 80 per cent. of pulmonary tuberculosis in patients dying of alcoholic neuritis; Osler finds a proportion of eight in eleven under the same circumstances. It is declared that pulmonary tuberculosis is more frequent in heavy drinkers than in people of moderate habits in the proportion of three to one. Lancereaux computes that more than one-half the cases of tuberculosis are due to alcoholism; and this, I believe, has been about the ratio in the medical wards of the City Hospital on Blackwell's Island.

It is difficult to explain the effects of alcohol. Like most of the simplest things in life, no definite agreement has ever been reached concerning its mode of working. Some consider that it is a preservative for living tissues as for others, because of the tendency to sclerosis which it furthers. Certain it is that there is no harder stock than the wine-drinking countries. Others hold that chronic alcoholics are more liable to tubercu-

losis because of the resulting tissue impoverishment.

The bad effects attributed to alcohol lie largely in the state of affairs which it connotes; unsanitary habits, poverty, lack of nutrition, bad food, ill-ventilated living-rooms, and most of all a condition of the organism exhausted by overwork, in which the reserve force is all that is left to carry on the struggle for existence. Oftentimes alcohol is taken first with a view to keeping a defective economy up to the working point, perhaps in a tuberculous subject, or in one in whom all the conditions are receptive to tuberculosis; alcohol is then taken in increasing amounts to stimulate the flagging energies, thus making a bad matter worse. Some who contract tuberculosis have occupations conducive to alcoholism, such as workers in the liquor trade, barmen, waiters and hotel-servants, people who are thus employed because they are from their physical and moral make-up unsuited for another sort of work.

Poverty, with all that it implies—underfeeding, deficiency of sunlight, defective ventilation, overcrowding, uncleanness, and bad drainage (which induces damp walls in houses), stands enormously in a causative relation to tuberculosis. Biggs has graphically demonstrated this by means of maps of various sections of this city. Bulstrode submits the death-rate from pulmonary tuberculosis in Hamburg among the several income tax classes (inclusive of the dependents of taxpayers). For incomes from nine to twelve hundred marks the death-rate is 55.4; for incomes of from twenty-five to fifty thousand marks the death-rate is 7.5; a proportion against the poorer classes of nearly eight to one.

I can but indicate a subtle relation which seems to obtain between insanity and tuberculosis. It seems that many in asylums who have tuberculosis contract, or at any rate develop the disease in these institutions. One account states that in 74 consecutive cases of pulmonary tuberculosis, in ages between twenty and sixty-two years, only three had evidence of tubercle before admission to the institution; it is furthermore observed that those who enter an asylum with tuberculosis have little chance of recovery while they are inmates.

The plan of sending tuberculosis patients away from the large cities into the country to enjoy the benefits of fresh air and water, sunshine and good food, is of course ideal therapeutics, yet if the consumptive were to go into farm-life and if he were to adopt habits which obtain in many rural districts, he would never get rid of his disease. Among these habits of life are, I believe: an execrable diet, to which meats other than bacon are practically strangers; canned fruits and vegetables and condensed milk being largely consumed, the fresh foodstuffs—including eggs—being sold for urban consumption; intermarriages through several generations in families living within a few miles square; morphinism; a seemingly innocuous imbibition of stomach bitters, cider, and perhaps other insidious fluids; and the

constipation habit, which if formed in the Winter months, through disinclination to venture to out-houses in the intense cold.

Altitude, temperature, moisture, season and soil may be predisposing factors; these need no amplification. Pulmonary tuberculosis occurs in inverse proportion to the height of a given district above the sea-level.

Tuberculosis is prone to follow upon other diseases, such as bronchitis, influenza and neglected colds; Fanning reports 28 cases in 100 in which pleurisy was antecedent; and 10 cases in 100 in which pneumonia was antecedent. In none of these cases was he able to get a definite history of auto-infection from other parts. Convalescents from the exanthemata, diphtheria and typhoid; and the co-existence of such affections as syphilis, malaria, and diabetes are powerful elements in the growth of tuberculosis. The Koch bacillus finds the sugar-containing tissues of the diabetic an unusually congenial host.

There are a number of trades which may stand in a causative relation to tuberculosis. In the excellent book entitled *Dangerous Trades* there are nearly sixty such occupations specifically considered.

Among predisposing causes we must include various forms of direct injury resulting in contusions, wounds and lacerations. These traumatism greatly favor the development of the tubercular infection, but they are not essential; for the Koch bacillus may penetrate the unbroken skin and mucous membranes. It is very likely that traumatism often result in tuberculosis by exciting nervous reactions.

And this suggests a consideration of the influence of psychism upon tuberculosis. It is difficult to gauge such influence; to compute the extent to which thought can affect the development of a leucocyte, the making of a drop of lymph, or the behavior of an excretory cell. The process is not susceptible of investigation by the microscope or by laboratory methods. Nevertheless it is essential, notably in tuberculosis, that the influence of the mind upon the body be not lost sight of. It is in every one's experience that mental perturbations derange the functions of various organs. Why may not acute shock, such as attends traumatism, or chronic shock, such as accompanies nerve exhaustion, or a protracted play of profound emotions, predispose to graver affections. Fanning indeed specifically states that overwork and anxiety have stood in a causative relation to tuberculosis in 34 per cent. of a series of his cases. And it is an altogether scientific, practical procedure to note that the vaso-motor system is an essential part of the machinery through which thought manifests itself; that passive congestion from any cause makes a tissue susceptible to tuberculous deposit; and that aberrations in the vaso-motor system constitute the likeliest factor to bring about blood-stasis.

Thus have I essayed to sketch briefly a few conditions predisposing to tuberculosis; it were

impossible even to mention all such. For we are told that living itself is but the body's response to environmental influences, either physical or chemical in character; and these are about as numerous as are external phenomena. Personally, I would reserve the opinion that the whole of life is by no means comprehended in this statement; still it is valid as denoting the innumerable agencies which may make the organism receptive to tuberculous infection.

We may note, then, in a review of ante-natal conditions that fresh parental blood, and all that it connotes will surely beget healthy offspring, having tissues resistant to pathogenic agencies. Impure blood, and its associations in the parents will result in degenerated tissues in the offspring. This is true for other diseases in which a vicious nutrition is transmitted, as syphilis, alcoholism, epilepsy, asthma, insanity and cancer, as for tuberculosis; there is then no reason why the influence of heredity in the latter should be ignored.

I am aware that the term *scrofulosis*, which I have used, is absent from the indices of up-to-date text-books; its manifestations being generally considered under the term *tuberculosis*. Yet I think that these are by no means synonymous terms. They are not the same disease, simply because they often co-exist. The term *tuberculosis* is meaningless, unless it implies the presence of the Koch bacillus; and this I believe, is by no means invariably the case in *scrofula*. This latter term may be unfortunate; but there is none other which represents, as it does, a distinct entity upon which the tubercle bacillus is often, but not always implanted. The *scrofulous* constitution is sensitive to all irritants and infections, not only to tuberculous infection. *Struma* is largely a transmitted condition; children are born manifesting it. We may well agree with Duckworth that "the influences by which *scrofula* has become a permanent element in human society have probably affected several generations in succession." In some cases there is, as we have noted, congenital infection; but in most cases there is no such infection. The parents may transmit an influence by toxins; but toxins cannot generate bacilli. Children are born with the *scrofulous* temperament, upon which many other factors soon react as complications. Such are unsanitary conditions, as impure air, lack of sunshine, poor food and drink, tenement life and the like. The tubercle bacillus becomes implanted; then skin lesions, abscesses, and enlarged joints follow: the *scrofulous* child is seldom born with these lesions.

With regard to the disease tuberculosis itself. The Koch bacillus is by no means the only factor to be dealt with. This bacillus has probably had an existence co-eval with man; it is all-pervading; the consumptive emits several billions of it during the twenty-four hours; yet most of us do not suffer from tuberculosis. The whole of tuberculosis is not comprised in this micro-organism, an index of a disease which is the resultant of many factors. Much has been done

for the relief of tuberculous patients; but the discovery of the Koch bacillus has not primarily influenced the treatment of the disease. It were irrational in the last degree to deny that drugs may be useful; nevertheless it is a striking fact that since Koch's discovery in 1881, there has not been one important addition to the pharmacopœia such as would prove directly efficacious against this bacillus. The anti-microbic drugs, which have been given internally with a view to destroying the bacilli, have generally been worse than useless. This is particularly true of those which have been malodorous and have nauseated. And if the ideas set forth in this paper are true, inhalants have been altogether unscientific drugs; and hyperalimentation, whenever it has deranged digestion and disturbed metabolism, has been vicious rather than beneficial in its effects.

Duckworth considers that the discovery of the Koch bacillus has not fundamentally changed the state of affairs. It has, however, and on the whole beneficially; but not always. For, as we have just noted, treatment by antiseptics taken internally and directed only to the elimination of micro-organisms has generally proved deleterious. But Koch's discovery has been beneficial in that it has led to the adoption of such principles of prophylaxis and sanitation as have been found effective against infections generally. The non-drug procedures, although they may have been directed against the bacillus, have nevertheless had their real usefulness in rendering the organism resistant to microbic infection. Our improvement in the treatment of tuberculosis lies, not in the use of any special bactericide, but in our appreciation and adoption of hygienic measures.

If the positions I have expressed as to the parts played by nutriment and digestion are sound, it is evident that the sooner the question of the identity of human and bovine tuberculosis is settled, the better it will be for rational medicine.

We have now several immunizing serums which promise much in the way of rendering the tissues resistant to tuberculous infection; it is heartily and most sincerely to be hoped that all expectations entertained for them will be realized. However these serums will never exceed in value such immunizing agents as fresh air, sunlight, cleanliness, baths, dry-walled, well-drained and well-constructed houses, good food and drink, and a general understanding and dissemination of the laws making for health.

To revert in conclusion to heredity, we may note that as functional rather than anatomical modifications are transmitted, much may be done in the way of education and physical training to eradicate vicious metabolism and tissue-tendencies; of course immediate results will not be expected.

I think, indeed, that the physician should take a very broad view of tuberculosis, a view the horizon of which would extend far beyond the incidents which are termed life and death. For this disease, which leaves its mark upon practi-

cally the whole of the race, is an index by inversion of human progress; the latter will advance in proportion as the former becomes eradicated. Descartes was not altogether right when he declared that if the race is ever to attain perfection it must be by means of the medical sciences. However, if the principles of hygiene and prophylaxis were universally grasped and applied, the race would surely be far advanced toward an ideal state.

THE INDICATIONS FOR THE LIGATION OF THE INTERNAL JUGULAR VEIN IN LATERAL SINUS THROMBOSIS.

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IN considering the important question as to the advisability of shutting off the internal jugular vein from the general circulation with which it is in relation, in the presence of thrombosis of the lateral sinus, several aspects from which the problem must be viewed at once present themselves. The primary aspect of the subject resolving itself as to the advisability or non-advisability of ligating the vein at all; the opponents of this measure claiming that the procedure presents no features of value, as many cases in which it was apparently indicated have recovered without it. Another reason being that when ligated as a means of preventing infection and this is the practical object for which the operation is performed, it does not attain this end, as the infectious material may be carried into the lungs by the other internal jugular vein. And further, owing to the infiltration of the tissues in its immediate proximity, it often becomes extremely difficult to find the vein and remove the larger portion, while finally and this is the only objection that is at all worthy of consideration, the procedure adds greatly to the gravity of the operation.

While it is to a certain extent true that a small amount of infective material may become distributed through the opposite vein, yet this is of little practical moment if the affected sinus clot be thoroughly removed, the main bulk of the infection which is seriously impairing the health of the patient, being derived from the affected side and the consensus of otological opinion is apparently in favor of ligating the jugular under certain conditions which will be discussed later. While the operation is necessarily prolonged when in addition to the other requisite procedures, the vein and its important tributaries are ligated and excised, yet compared with the prolonged and often fatal pyemia which may develop should this channel of infection not be removed, the dangers to the individual are not necessarily increased in my experience and the favorable results obtained, more than counterbalance the severity of the procedure at the time of operation. This is shown in the statistics prepared by Koerner, of thrombus of the lateral sinus in which in 42 cases, the jugular was ligated in 26 with 63.4 per cent. of cures, while in the remain-

ing 16 cases, in which the jugular was not ligated, there were only 42 per cent. cured. When the vein was tied before evacuation of the sinus in 19 cases, there were 68 per cent. of cures; when ligated after evacuation of the sinus, 60 per cent. recovered, while in the remaining one case of recovery, the vein was ligated without evacuation of the sinus. The same author has also reported 20 cases with 13 cures in his personal experience and advocates early ligation as a measure for the prevention of the passage of septic emboli into the circulation from the septic phlebitis of the lateral sinus.

Brieger ignores the general symptoms of pyemia in deciding the matter of ligation and considers it only justifiable when local indications exist, the systematic application of the procedure as an integral part of the operation for sinus phlebitis as he considers it, is never justified. Of course this is quite correct, for one is never justified in advocating ligation of the jugular in all cases of sinus thrombosis, but the local symptoms are often indistinguishable and cannot always be depended upon as an aid in determining the matter and to my mind the presence of pyemic symptoms before the sinus has been exposed, in conjunction with any local symptoms that may be present, should all be carefully weighed before determining the procedure to be acted upon, in a given case.

Jansen's experience is also in favor of ligation in the presence of definite symptoms, as in 7 cases where the vein was tied, 6 recovered, while in 8 cases in which the vein was ignored, but 5 recoveries ensued. Habermann holds somewhat of the contrary view and opposes a too arbitrary procedure respecting operation, not only in cases pertaining to ligation of the jugular but even in sinus phlebitis. He bases his belief of non-interference on a case of extradural abscess in the posterior cranial fossa, with a firm thrombus of the sinus and in which the walls of the jugular were quite discolored. He removed the discolored part of the vein but left the thrombus in the sinus undisturbed, yet the patient recovered. As far as the presence of a non-septic, firm thrombus limited to the sigmoid sinus is concerned, I would not of course interfere with the corresponding jugular, as in these cases ligation is never indicated, but when there are the least evidences of septic changes either in the walls of the vessel or in the contained thrombus, with these septic alterations extending to the jugular or passing through this vessel to the extent of producing pyemic symptoms, the jugular vein in my opinion should be ligated and the affected portion excised.

Brieger believes that the ligation is only justified when the thrombus has extended into the vein and cannot be positively prevented from passing toward the heart, although he is of the opinion that the closure of this pathway does not always insure against the escape into the circulation of particles from a disintegrating thrombus, as illustrated in a case under his care of sinus phlebitis, in which he made a low ligation of the

jugular, yet pathological changes in the lungs followed the operation. Voss has also observed this late metastatic process after ligation in some cases, but he considers the chances for the patient as much better when the vein is ligatured, while Uchermann maintains that ligation need only be undertaken when the symptoms of pulmonary infarction are beginning to develop. I am not at all in sympathy with this opinion and in cases seen late where the first symptoms of septic changes are evident, although the sinus thrombus has existed for some time, I believe it will be wise to ligate the jugular immediately, the successful results obtained being dependent upon early and prompt closure and obliteration of this avenue of infection.

As pointed out by Whiting, the indications for this procedure vary as to whether the sinus has been exposed or not and if exposed, whether opened by the operator. The most difficult cases in which to determine whether ligation shall be performed or not, are those in which no operation has as yet been performed upon the sinus or mastoid, in other words, the primary ligation before exposing the sinus. This being illustrated by the following case:

• J. M., male, thirty-four years of age; never had any trouble with his ears until six months previous to when he was first seen. At that time he developed an acute otitis media of the left side following swimming. The ear was treated with the usual home remedies and the abscess discharged on the third day. The discharge then gradually diminished in amount and two weeks later had entirely ceased, but he then commenced to complain of dull pain over the mastoid which was intermittent, but gradually increased in intensity. His appetite failed, he became anemic and lost considerable weight, frequently being incapacitated for work for several days at a time on account of the pain in his ear and general malaise. Three months later he stated that the mastoid became swollen and a small amount of thick, foul matter was constantly discharging from the ear. At this time he developed a cough and two weeks before being first seen he felt chilly at times and on the slightest exertion would perspire freely, diarrhea alternating with constipation also being present. On examination of the affected ear, there was seen a small perforation of Shrapnell's membrane, through which a drop of offensive greenish pus exuded. The posterior superior auditory canal wall was bulging and the mastoid and occipital region on the same side were edematous, as was also the upper cervical region. The man was markedly septic, his pulse was 130, while the temperature was 104° F., which three hours later, at the time of the operation, had dropped to 99° F.

Although he was already pyemic, it seemed a typical case in which to ligate the jugular as the first step of the procedure and after the usual aseptic precautions this was done low down in the neck, with in addition, ligation of the communicating veins. Two ligatures were used on

the jugular, the upper one being as high as possible and the entire vein was dissected out, considerable difficulty being experienced on account of the inflammatory infiltration of the surrounding tissues. The usual mastoid operation was then performed, free communication being made with the antrum and an enormous amount of fetid pus and necrosed bone were removed. The sinus was freely exposed, opened and contained the purulent disintegrating remains of a previous thrombus which had extended into the upper third of the jugular vein. The entire septic area was removed as far as possible, but considerable haste was necessary on account of the extremely precarious condition of the patient. The usual dressings were applied and after the intravenous injection of salt solution, the patient gradually rallied. The progress of the case was favorable until the fifth day, when the temperature rose to 102° F. and he complained of some pain and stiffness in the neck and a small purulent foci was evacuated immediately below the mastoid. The temperature then declined to normal, although there was a slight rise on the fourteenth day to 101.4° F., when a small abscess developed on the left forearm which was evacuated, after which the patient made a rapid recovery.

While in this case the indications seemed perfectly plain as regards primary ligation of the jugular, such is not always the case especially when the pyemic symptoms are not well marked, or when the vein itself gives no indication of septic or thrombotic changes. But not only in the milder cases but even under the most adverse conditions of purulent phlebitis of the sinus and vein, when metastatic abscesses are present in various portions of the body, a small proportion of these cases recover after extensive operative interference including resection of the jugular. But in those cases in which the infection has extended into the jugular vein and resulted in a suppurative phlebitis in order to anticipate or prevent the dissemination of the septic material, the vein should be ligatured as low down to the clavicle as possible and also a second ligature should be placed high up and the entire vein removed from the neck. Milligan reports such a case in which the internal jugular was ligated then the usual mastoid operation was performed and the sinus cleaned out through the opening of the vein in the neck. The patient promptly recovering. Zaufal also reports a similar case of septic otitic thrombosis of the sigmoid sinus, in which the vein was ligated and the sinus laid bare, recovery occurring in six weeks notwithstanding the development of metastatic abscesses in the glutei muscles and the development of purulent pleurisy. While Ridley records a case of pyemia terminating in recovery, in which he ligated the jugular, evacuated an epidural abscess and removed the purulent contents of the sinus.

The indications upon which one is justified in opening the jugular previous to operation upon the mastoid are principally, the presence of septicaemia or pyemia as shown by the general condi-

tion of the patient and especially by the presence of a high temperature and rapid remissions even to subnormal, with quick alternations to the high point again in a few hours. In all cases where such a condition is suspected the temperature should be taken at least every hour. Repeated rigors are also observed and may be the first sign noticed. Great value from the diagnostic standpoint should be attributed to this symptom. Metastases of the septic material to the lungs, joints or any portion of the body, clearly indicate operative procedure and in the presence of such purulent collections, no hesitation or palliative measures should be advocated, but immediate ligation of the jugular should be performed, followed by the usual operation upon the purulent collection at its source. Occipital edema though rarely present, is of value when found and in addition to the clearly evident middle-ear suppuration and mastoiditis, would even in the absence of other symptoms indicate the involvement of the jugular and the consequent damming back of the blood in this region. The same may be said of edema of the eyelids of the corresponding side, except one would hardly be warranted in tying the vein unless other corroborative symptoms were also present.

Beginning or well marked neuroretinitis occupies to my mind, the same value as the former as an indication for operation, while tenderness along the jugular in the neck, with the presence of a cord-like sensation under the fingers of the surgeon, is undoubtedly the most reliable local symptom and when such is present in a given case, I would not hesitate to ligate and remove the diseased vein before the mastoid was explored. Chipault advises in these cases, that the more radical the operation the better will be the results and to obtain a complete removal of the purulent foci he ligates the jugular and removes it, then ligates the transverse sinus as near as possible to the torcular and performs the usual mastoid operation, with complete opening of the sigmoid sinus and lavages the parts twice daily. While this procedure is based upon the very sound premises that isolation should always be obtained before evacuation, in order to avoid dissipation of septic emboli, I question whether it is judicious or necessary, in the large majority of cases, to apply a ligature above the knee of the sinus as the establishment of free hemorrhage from this end washes out the thrombus and accomplishes the purpose.

Viereck clearly indicates this phase of the subject when he states that ligation of the jugular in operating for thrombosis of the sinus, is not generally adopted on account of some slight danger connected with it and of the possibility of impeding the outflow of the facial and cranial veins. Therefore its beneficial effects should be demonstrated by large and accurate statistics from which however should be excluded deaths from other causes such as meningitis, cerebral abscess, delayed operation and previous metastases. The use of the ligature is indicated in all cases where

there is danger of pyemic or localized metastases, and its application prevents pyemic infection, with greater safety and assurance, than does simple opening of the sinus. Therefore it ought always to precede the latter, thus preventing any danger of the breaking up of the thrombus and the aspiration of an air embolus.

Of the lesser pyemic symptoms which should be taken into consideration in determining operative procedures, profuse sweating without apparent cause requires mention, while vomiting, anorexia and accelerated pulse rate in conjunction with an otherwise obscure history, may be of service in elucidating an accurate understanding of the individual case. In but one of the three cases herewith recorded was pressure over the internal jugular at the upper third portion of its course, productive of pain.

Jansen operates as soon as it becomes evident that there is septic degeneration of the clot and ligates the jugular without further investigation of the sinus. He reports 6 cases, 4 of whom succumbed. While Eulenstein reports a successful case; Köhler an unsuccessful one and Green states that before opening the sinus, the jugular had better be ligated to prevent displacement of the thrombus and resulting general infection, but the danger of a prolonged operation, or infiltration of the neck from a gravitation abscess through the base of the mastoid, or from periphlebitis, may render ligation inadvisable or impossible. Pritchard also holds to the same opinion, inasmuch as he believes the jugular should first be ligated and when the septic process is far advanced, it may be advisable to dissect out the vein even to the extent of its whole course in the neck. Such apparently heroic measures sometimes saving an otherwise hopeless case. While Church inclines to a somewhat opposite view and believes that it is not necessary or advisable unless the clot is septic or broken down, while if the sinus is filled with a fibrinous clot, ligation is clearly not indicated.

Of the second class or those cases in which the sinus has been exposed but not opened, the indications for ligating the jugular before further operative procedure in the direction of the sinus, are but two in number, the first practically being the one of greatest importance. When in this class, the presence of a clot has been determined by the usual methods and aspiration shows that the lower portion is beginning to disintegrate, one is certainly justified in immediately ligating the vein and I believe this is indicated even more forcibly when septic symptoms of even a minor degree are present, although no emboli have as yet entered the circulation. This was the indication upon which ligation was performed in the following case:

T. G., male, aged thirty years. When ten years of age he had an attack of measles and since then he has had an intermittent purulent discharge from the right ear. At times it would almost disappear and then would discharge profusely following repeated attacks of coryza. While the

ear was slightly painful at times, yet it was never severe enough to cause complaint until five months ago, when the discharge gradually diminished in amount and the pain increased in intensity, causing considerable suffering especially early in the morning. Examination showed a slight purulent discharge from the right canal, with an intensely foul odor. There was a small patch of caries on the posterior wall and the mastoid was considerably swollen and tender upon the lightest touch. The occipital tissues and the parts over the upper portion of the internal jugular vein were also in the same condition. There were the physical appearances of sepsis, with cachectic features, coated tongue and a constant diarrhea; pulse 120, temperature 103° F.

Immediate operation was advised and performed the same day under ether anesthesia. The auditory canal was cleansed and a probe passed through the sinus in the wall, well into the mastoid. The usual mastoid operation was then performed, but on account of the extensive destruction of the osseous cortex and cells, the pus and débris were readily removed with a spoon curette. The inner table over the sinus was in part destroyed and from the apparently septic condition of the contained thrombus, it was necessary to ligate the jugular vein, which was done immediately above the clavicle and a second ligature was placed as high up as possible. The vein was then dissected out in its entirety and the smaller communicating veins were ligated as this portion of the operation was proceeded with. The jugular was found to be filled in its superior part with pus and the remains of a broken down thrombus. At this stage of the operation the patient began to do very badly and an intravenous injection of salt solution was given with a most beneficial result, oxygen also being administered during the remainder of the operation.

The sinus was then opened and found to be in the same condition as the vein and the contents were removed, although great difficulty was experienced in releasing the upper end of the thrombus which was still firm. The bone was chiseled away almost to the torcular before free hemorrhage could be established. I believe in this case that the thrombus extended beyond into the lateral sinus of the opposite side. On account of the extremely bad condition of the patient, the parts were rapidly cleansed and packed with gauze and the usual dressings applied. The temperature, low for four days, rose to 103° F., and it was found that there existed considerable pus under the sternomastoid muscle. This was removed and he slowly improved, although the blue hue of the face sometimes observed after removing the jugular vein, remained for nearly two weeks. The temperature then returned to normal until the eighteenth day, when it suddenly rose to 101.2° F. without apparent cause, the incisions both in the neck and mastoid appearing perfectly healthy. It, however, only remained at this level for several hours, then declined and the case progressed through the usual course without

further trouble. When seen, four months later, he had nearly regained his former weight and presented all the appearances of good health.

Possibly this case should have had the jugular ligated as a preliminary procedure to the mastoid operation, as in the former case; the indications being fairly well marked, but on account of a difference of opinion among the medical gentlemen in attendance as to the relative value of the symptoms, the inability to obtain the consent of the patient to an operation involving an incision in the neck until it be found to be absolutely necessary, and the conjoint presence of tertian fever, the malaria plasmodia being found in profusion in the blood, this was not done until the condition of the sinus was ascertained by inspection.

The second indication for ligating the jugular after exposing the sinus, is the presence to the eye of the surgeon of the movements of respiration transmitted to the sinus, the dangers of embolism of air under these conditions and the implied presence of a thrombus entering well into the torcular, warranting the immediate ligation of the vein in the neck before the sinus is opened. This must be extremely rare, and it has been my fortune not to have seen a case in which this phenomena was well marked.

Joachim reported several similar cases, one in which the sinus was exposed and then the vein ligated, but as the case was profoundly septic, death resulted from metastatic pneumonia. The other he reported was operated on in the same way, but a solid clot was present. He believes that statistics show a greater preponderance of recoveries when the jugular has been ligated and considers it the part of prudence to tie the vein, although cases have recovered without ligation of the jugular, even when the lungs had already shown metastatic deposits. In the discussion following the reading of his paper, it was elicited that ligation was the course to pursue in all these cases where septic symptoms were present, as it did not add much to the gravity of the case and it prevented the septic infection from becoming more general. As pointed out by Buck if, upon exposing the sinus, the wall is seen to be ulcerated and purulent fluid and broken down debris are contained in the vessel, it is advisable to stop operative procedures in that direction and ligate the jugular before removing the diseased tissue. If the jugular is tied high up and does not contain a thrombus, no further interference will be necessary, but if the thrombus has extended downwards or if phlebitis be present, a second ligature should be placed as before mentioned and the vein removed.

From the local symptoms, it is not always possible to ascertain that the jugular is infected, as there may be swelling of the neck and even tenderness along the jugular, which may, as pointed out by Brieger, be due to pathological changes in the lymph glands, such a case coming under my observation very recently, in which chronic supuration of the middle ear was followed by mas-

toid disease and these symptoms referred to the cervical region were quite prominent. Considerable doubt was entertained however as to their being directly connected with the aural trouble and on performing the usual mastoid operation with exposure of the sinus, the latter was found to be perfectly normal. Forty-eight hours later the condition in the neck was cleared up by the development of erysipelas, which fortunately was a mild attack and no trouble was experienced other than that seen in the usual mastoid case. I think, however, that enlargement of the cervical lymph glands and infiltration of the soft tissues is a very valuable sign indicative of phlebitis and thrombosis of the internal jugular, the condylar and the deeper veins of the neck. This infiltration often undergoes purulent inflammation. In two cases which I have seen, the abscess formation seemed to localize for the time being the process of disintegration and formed a barrier between the lungs and the abscess, by the formation of a thrombus in the lower portion of the vein.

The third group of cases, are those in which the sinus has been opened and a large thrombus extending down into the jugular with coexisting purulent disintegration is seen, but which has not before been recognized. Under these conditions it is practically impossible to remove the putrid mass without dislodging dangerous particles and the indications are perfectly clear to ligate the jugular vein in order to prevent the general dissemination of the septic material.

Another indication for ligation which holds good under the same circumstances, is the presence of a large firm thrombus, filling the sinus and extending well down into the vein. After the sinus has been opened and the presence of such a clot determined, it is manifestly poor surgery to allow it to remain even should no septic or disintegrating changes be present in the given case, and as it is practically impossible to remove it through the opening in the sinus, without the danger of seriously damaging the deep tissues of the neck, it is necessary to ligate the jugular in order to effect thorough removal with the least danger to the patient. As the presence of such a clot prevents the flow of blood and it is necessary to reestablish the circulation, one is perfectly justified even if the presence of the thrombus in the upper portion of the jugular is not recognized, in ligating the vein, whenever it is impossible to produce a free flow of blood after the sinus has been evacuated as thoroughly as possible.

Schwartz, Poli, Grunert, Alderton, Kerr and others have reported cases of interest in this connection, while Eulenstein records an exceedingly instructive case of otitic pyemia, in which ligation of the jugular was performed three days after surgical exposure of the middle-ear cavity, lateral sinus, posterior cerebral fossa and evacuation of a large pus cavity near the jugular bulb. As pyemic symptoms continued after the operation, ligation was considered as a last resort, although there were no symptoms of a thrombosed

condition of the vein; the patient recovering. Similar to this was the case reported by Toeplitz, of pyemia, with the development of abscesses in various parts of the body and the complete recovery of the patient after cleaning out the lateral sinus and ligating the vein. While as an example of the extremely serious condition the patient may be in and yet recover, is the case of Ballance's, of a pregnant woman, twenty-four years old, with a severe suppurative otitis, swelling of the posterior canal wall, the presence of granulation tissue and a discharging sinus, double optic neuritis and chills with fluctuating temperature. The mastoid was opened, the jugular was ligated in two places and incised and was found not to contain a thrombus, but was collapsed owing to the obstruction of the blood current higher up. Metastatic abscesses formed in the shoulder, tonsil and leg, there was sinus thrombosis with subdural abscess. Premature delivery occurred and in addition to suppurating tonsillitis, there were two attacks of erysipelas and jaundice.

Cheatle in expressing his views as to the indications for jugular ligation, believes that it is not always necessary in thrombosis of the lateral sinus, with which I am in perfect accord, but to use his words, "If it seems that there is healthy looking clot well below the broken-down area, ligation of the vein is not necessary, but it must be remembered that the presence of even one rigor demands immediate operation." As an example of the third group, or those in which the jugular is ligated after the sinus has been exposed and opened, the following case is presented.

C. Y., male, aged eighteen years. Chronic suppurative otitis media since his fourth year following scarlet fever. Profuse discharge for a number of years with a fetid odor. Has had local non-surgical treatment off and on, but with no lasting results. One week before I saw him he went swimming and within a few hours, the discharge from the right ear practically ceased. The following day he complained of pain over the mastoid, with gradually increasing malaise, anorexia and on the day previous to when first seen, he suffered from chilly sensations. On examination, the mastoid was swollen, boggy and there was slight tenderness on deep pressure along the upper part of the jugular vein. A small amount of foul pus was removed from the middle ear and the posterior superior wall was found to be bulging into the canal. The temperature was 102° F. in the morning and varied from 99.2° to 104° F. during the day.

The following day the mastoid was opened under ether anesthesia and was found filled with foul pus and granulation tissue. Communication with the middle ear was established and a large quantity of necrosed bone was removed. The sigmoid sinus was then exposed and laid freely open, when a clot was found almost completely filling its walls and extending into the jugular vein. Beginning disintegration of the thrombus was evident, so the internal jugular was ligated

low down in the neck. The sinus was then evacuated and the entire field of operation was cleansed with bichloride solution, followed by packing with iodoform gauze. The following day the temperature was 101° F. and after the second day returned to normal. The patient made a rapid recovery and after a year's interval, he remains perfectly well with no discharge from the ear.

A number of similar cases have been recorded by McKernon and he considers as indications for ligating the vein after the sinus has been opened, the presence of a disintegrating clot or pus. While he also states that in the presence of marked physical signs of jugular involvement, it is good advice to ligate the vein before opening the sinus above, provided we are sure as to what we are going to find, but in the majority of cases, no positive diagnosis as to the condition of the jugular can be made before the sinus operation.

From the cases of sinus phlebitis both with and without involvement of the jugular vein, that have come under my observation, it has seemed advisable for the best interests of the patient to ligate the vein whenever local symptoms indicating its involvement were present. When the patient presented evidences of sepsis and especially irregular temperature and rigors and when after the mastoid has been opened, the presence of pus was evident in the vessel.

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Changes in the Cornell University Medical College.—Dr. Alexander, Professor of Genito-urinary Diseases, has obtained a leave of absence on account of illness, and this year the lectures upon the surgery of the genito-urinary tract will be given by Dr. Charles L. Gibson.

CHORDA VENEREA.*

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CLINICAL DEFINITION.—A complication of acute gonorrhea, characterized by intense pain during erections and the bending of the penis in an abnormal direction. This condition is considered a complication of gonorrhea on the premises that an acute, simple or an uncomplicated case of gonorrhea is a specific infectious inflammation of the mucous membrane of the anterior urethra and is limited to the epithelial layers of this membrane, for the reason that this tissue, the epithelium, is the normal feeding ground of the exciting cause of the disease, the gonococcus of Neisser. Therefore any extension of the inflammation beyond the epithelium into the adjacent tissue, is a complication.

Pathology.—The gonococci, usually within twenty-four to forty-eight hours, penetrate the epithelial layers of the mucous membrane and cause the following phenomena to take place in the submucosa: Congestion of blood-vessels; hypersecretion of glandular tissue; diapedesis (exudation of the elements of the blood); phagocytosis; production of embryonic cells.

Congestion of blood-vessels, diapedesis, phagocytosis and production of embryonic cells, interpreted in a general manner, signify infiltration of the tissues of the penis by the contents of the blood-vessels, the red and white blood-corpuscles, serum etc. And in addition to this, there is the formation of fibrinous coagula and embryonic cells. Histologically, the tissues involved are mainly of the dilatable character known as spongy tissue. The shape and average size of the penis can readily be called to mind. Practically, from a mechanical point of view, this organ consists of three cylindrical tubes of spongy, flexible tissue. Macroscopically, they are separate and distinct from one another and placed with their long diameters parallel and in such apposition, that two of the tubes, the "corpora cavernosa" form the base of a triangle and the dorsum of the penis, and the remaining tube, the "corpus spongiosum" through which the urethra passes, the apex of the triangle and the inferior surface of the penis. Microscopically, the tissues comprising the urethra and the three corpora, are intimately enough related to permit an inflammation to extend by continuity to all the tissues comprising them. Especially is this true of the relationship between the urethra and the corpus spongiosum.

Infiltration of a portion of the urethra will cause it to become thickened, friable, lose its elasticity, and, on turgescence of the organ, crack in the area of infiltration, producing a fissure and the symptom of severe pain, that is characteristic of fissures even in less sensitive parts of the body. Infiltration of a portion of the corpus spongiosum will interfere with the dilatability of the consolidated area. On turgescence of the organ, this area will not dilate, and through interference with

the circulation, the dilation of the distal portion of the corpus spongiosum beyond it will also be incomplete. The two corpora cavernosa becoming completely dilated and also the proximal uninfiltreated portion of the corpus spongiosum, there will naturally result the physical symptom of chordee, a deflection toward the point of least resistance, which in this case is the partially dilated, uninfiltreated distal portion of the corpus spongiosum, with the consolidated area as the fulcrum. The direction of the deflection is usually downward, as the inferior surface of the corpus spongiosum is the portion of the penis most frequently affected.

The character of the chordee depends upon the amount of tissue infiltrated in depth rather than extent. It may vary in any degree, from the mildest form, which is caused by infiltration of all the tissues of the urethra proper, the epithelium, the submucosa, mucosa and the layer of unstriated muscular fibers, to the severest, which includes the mildest with extension of the inflammatory infiltration of the trabeculae of the corpus spongiosum, rendering them non-extensible, and the filling of the intrabecular spaces with inflammatory exudation that prevents their dilation during erection.

Etiology.—Anything that will aid the gonococci to penetrate beneath the epithelial layers, as intensity of infection; lack of resistance of the tissues to infection; "traumatisms that do damage to the epithelial layers of the mucous membrane, such as injections destroying the epithelium, misuse of a sharp pointed syringe, clumsiness in use of sharp irrigation nozzles, antrophores, sounds or catheters and especially violence in irrigations."*

Symptomatology.—Intense pain during erections and bending of penis in abnormal direction. The intensity of the pain is so severe, it is almost indescribable; by some the pain has been described as "the sensation of a hot wire drawn through the penis like the cord of a bow" (Valentine). Patients will often tell you that they feel as if they could bite a nail in two. It has frequently led to attempts to break the chordee; that is to straighten the organ by mechanical force, as by placing the penis against a resisting surface and striking it with some object, as the fist, the back of a book, etc. One case often quoted, is that of a patient who placed his penis upon the window ledge and then violently pulled down the sash upon it. Others have attempted relief by intercourse. The effect of such violence is to severely aggravate the already existing inflammatory condition, because of the lessened resistance of the injured tissue to further infection, and the formation of numerous foci of laceration, that may lead to deeper infection and terminate in chronic cavernitis; rupture of the urethra with a fatal hemorrhage, infiltration of tissue with urine, that may be followed by a urinary fistula, septiemia, gangrene of penis, etc. From any of these

* Presented before the Second Annual Meeting of the American Urological Association, at New Orleans.

* The Irrigation Treatment of Gonorrhea (Valentine). Given by him as the causes of cavernitis.

complications, if death does not occur, there will result a deformity of the penis, which will cause impotency from inability to have properly formed erections.

Prognosis.—Statistics not obtainable. Complete recovery is the rule. However, chordee no doubt increases the percentage of chronic gonorrhea, because of the greater possibilities of deep infection caused by this complication. It may terminate in chronic cavernitis and deformity of penis that will be so great during erection as to prevent intercourse, and thus cause impotency. Death from causes previously related under "Symptomatology" may possibly result, when violence is used to straighten the organ during an attack.

Preventive Treatment.—This demands the eradication of the causes of gonorrhea. Realization of the vastness of this branch of preventive medicine, "The Prevention of Venereal Diseases" prohibits any statements on the preventives of gonorrhea, for they would be not only foreign to the object of this paper, but unjust to a subject, whose vital importance to humanity, requires due deliberation and the best thoughts that the scientific and humanitarian mind of man can give.

The working premises upon which the theory of actual treatment is based, are as follows: Chordee, a complication of acute gonorrhea, due to the extension of the inflammation to the deeper tissues of the penis. Acute Uncomplicated Gonorrhea: A specific inflammation of the mucous membrane of the anterior urethra, practically conceived of as a local ulcerating surface, that physical rest cannot be given to, because located in a member of the body, the penis, which, from its nature and function, cannot be placed in a state of absolute quietness; neither can the ulcer be kept free from irritation, because located upon the surface of a canal, the urethra, through which passes an acid excretion of the body; nor can the ulcer be kept surgically clean, because situated in the urethral canal, the configuration and form of which retain the discharge, prevents free drainage, an ocular view of the inflamed surface and direct local treatment. Moreover, the ulceration is so inaccessibly situated and on a delicate mucous membrane, that local application of medicine to the inflamed area is impossible, unless the medicine at the same time comes in contact with the surrounding tissues. Therefore, the severe measures necessary to the destruction of the specific infection, the gonococci, cannot be used without causing greater damage to the surrounding tissues than would compensate for the benefit derived from the death of the bacteria.

In summing up our working premises, the following conclusions are deduced: That gonorrhea, therefore chordee, is a local diseased area inaccessibly situated, the successful treatment of which will depend upon one's ability to successfully devise the means of correctly applying to it the recognized principle of antiseptic and aseptic surgery.

The method of treatment to be followed will

be limited to any procedure that will improve the constitutional condition of the patient, overcoming the natural obstacles to surgical treatment previously mentioned and, in so doing, aid nature in obtaining rest, surgical cleanliness, reduction of congestion and absorption of inflammatory exudation. The principal means of obtaining the above results, rest, surgical cleanliness, reduction of congestion, and absorption of inflammatory products, I will endeavor to give, and shall attempt to classify under these headings in proportion as they attain their objects, though the difficulty of so doing satisfactorily, can be appreciated, as many of these means serve in varying degrees more than one purpose:

1. Rest, obtained (a) through general physical rest, confinement to bed (seldom possible); (b) through prevention of erections. This necessitates prevention of congestion and irritation of the sexual organs, their nerves and centers, and will be considered in combination with the second and third classifications.

2. Surgical cleanliness and freedom from irritation obtained, (a) through mechanical drainage, meatotomy to extent of three-fourths of the diameter of the urethra, (b) through flushing of urethra by drinking large quantities of water, a glass every two hours (no alcohol, no carbonated waters); (c) through keeping drainage free, by not applying the cotton or other dressing too closely to the meatus, and by frequently changing it; (d) through preventing reinfection from absorption of infectious matter of the discharge that accumulates upon the cotton applied to meatus, by using an antiseptic upon the cotton; (e) through always allowing the penis to hang down in order to give the discharge the benefit of gravity; (f) through having the suspensory fit properly, that is, support the testicles well, and not constrict the penis near its base, thus interfering with the circulation and by retaining the discharge on the proximal side of the obstruction, endangering the post-urethra and, by interfering with circulation of distal side, favoring congestion of the urethra anterior to the obstruction; (g) through instructing the patient not to strip the urethra, and thus disseminate the infection and injure the inflamed membrane.

3. **Reduction of Congestion Obtained.**—(a) Through regulating the diet, in ordinary cases to extent of eschewing highly seasoned foods and pastry, and causing meals to be taken regularly and eaten slowly. Otherwise, the natural daily diet; including tea or coffee once a day, which does not appear to affect the inflammatory condition adversely, but rather aids it by diminishing the mental depression that frequently accompanies this disease. In severe cases a fluid diet is indicated. (b) Through instructing the patient to sleep on a hard mattress with light covering. Not to rest on back, because the abdominal organs gravitating toward the pelvis, by their pressure, will cause congestion of pelvic organs and erection. Prevented by tying a towel about the abdomen and placing the knot in the small of

the back. (c) Through instructing the patient to absolutely avoid sexual intercourse, even the loving attentions sometimes deemed essential to wooing; and all scenes, literature and conversation that will evoke licentious thoughts; and by having him empty his bladder at least once during the night. An alarm clock set at about one hour before the usual time of rising, will aid in overcoming forgetfulness. (d) Through the administration of oleum santali (pure) c.c. .60 every two hours, until four doses are taken, then c.c. .30 every four hours if posturethra is involved or the dilution of the urine by ingestion of water does not relieve the irritation caused by the acid urine and urinary solids. (e) Through keeping the bowels free with magnesium sulphate gm. 3.75 night and morning, thus depleting the pelvic circulation. (f) Through instructing patient to avoid getting feet wet and sudden changes of temperature. (g) Through instructing the patient to bathe the penis at least twice daily, if not oftener, in water as hot as can be borne. This not only diminishes congestion, promotes phagocytosis and absorption of inflammatory exudation, but frees the glued together meatus and facilitates the escape of the discharge and diminishes the suffering of the patient. If possible, a sitzbath should be taken at night. And if the posterior urethra is involved or erections frequent, in addition an enema of one pint of hot water with one teaspoonful of salt in it, is of benefit, and can be repeated in the morning if necessary. (h) Through aseptic irrigations of the urethra twice daily with at least one liter of a hot solution. Intravesical irrigations are indicated, especially if posterior urethra is involved. However, the therapeutic advantages to be derived from irrigations will depend upon the gentleness and skill of the administrator.

Results are advantageous by mechanically rendering the whole canal of the urethra and the inflamed surface, without injury to it, free from the discharge that may produce additional foci for deeper infection, from stimulating the circulation by the heat and friction. This relieves the congestion, aiding phagocytosis and promotes the absorption of the inflammatory exudate. (If the theory is true that large volumes of hot water (110° to 120° F.) when used in the urethra produces a species of artificial edema.) These urethral lavages, by causing a swelling of the epithelial cells, aid in the cure of gonorrhea by retarding the progress of penetration of the gonococci by mechanically obstructing their advance, through obliterating the spaces between the epithelial cells. For, as demonstrated by Finger, Durkier, Rosinsky, Jadassohn and others, the gonococci penetrate the epithelial layers by gliding between the cells.

The ideal solution to be used, is one that will have the power of penetrating the tissues, yet possesses such bactericidal strength that it will kill the gonococci, but not injure the mucous membrane. The newer silver salts, such as argonin, argentamin, protargol, largin, argyrol, etc., at

present best fulfil this object. The one to use depends upon the severity and character of the inflammation.

To recapitulate the bactericidal benefit derived from irrigation with a hot solution 110° to 120° F. can be explained on the following theoretical grounds: That irrigation causing swelling of epithelial cells prevents penetration of the bacteria to the deeper tissues. The bacteria thus retarded are more apt to be affected by the antiseptics used. That the mechanical removal of the discharge aids phagocytosis, prevents dissemination of infection; that the heat diminishes congestion, stimulating the circulation and aids phagocytosis. Phagocytosis is nature's method of destroying the gonococci. Irrigation therefore, derives its bactericidal value from placing the gonococci between two fires: The antiseptics of man and the phagocytosis of nature.

The foregoing statements, as previously intimated, are an attempt to classify the general surgical principles and theories useful in the treatment of gonorrhea and prevention of chordee.

The main object, however, in writing this paper, has been to add to these general principles a hygienic detail in treatment, the value of which I believe as yet is only partly recognized and that is massage of the prostate and seminal vesicles in acute gonorrhea. For massage of the prostate and seminal vesicles in acute gonorrhea, the following advantages in treatment may be claimed: In massage we have an efficient method of preventing erections; as a result, the pain of chordee is obviated and congestion, a predisposing factor to the further extension and continuance of the gonorrheal infection, lessened; in massage we have the means of producing a beneficial psychological effect upon the patient. The theory of the treatment is explained to the patient and he is told how the semen is stored in the seminal vesicles until becoming overdistended, they excite the sexual centers and cause erections and ejaculation. And he is then informed that by massage, the overdistention is relieved and the semen expelled, and therefore he cannot have erections. The psychological effect thus produced is often very effective in preventing sexual excitement and is of special service in the case of those whose social life or occupation brings them in contact with women, as for instance, married men. Moreover, as a passing comment before proceeding, in the neurotic, in whom emissions without intercourse are associated with the horrors of the damned, silence on the theories of emissions, an optimistic view of the case and a systematic robbery of the seminal vesicles have their advantages. In massage we have a hygienic method of procedure that no longer necessitates the disordering of the systemic condition with bromides, the monobromates of camphor, codeine, etc. Moreover, in all possibilities we have in it the means of diminishing the percentage of cases of infection of the prostate and the posterior urethra. And in practising massage, we have the immense advantage of early diagnosing the involvement

of the prostate; and, in the frequent examinations of the normal prostate, have the opportunity of training the tactical sensibilities to a degree that their value as essential aids to the diagnosing of prostatic diseases is realized in actual practice as well as in theory.

The premises for the above conclusions are as follows: The sufferer from gonorrhea is accustomed to sexual intercourse, *i.e.*, the active physiological phenomena of the sexual instinct, the secretion of the semen, erections and ejaculation, have become a physiological law that an acute gonorrhea does not interfere with. On the contrary there is an increase in the frequency of erections; in the amount of semen produced, and, if it were not for the cessation of sexual intercourse (a physiological habit), there would be an increase in the frequency of emissions. In other words, as a concomitant of gonorrhea, there is the following abnormal stimulus to the nerves of the sexual organs and centers: (1) The congestion of inflammation; (2) presence and multiplication of gonococci; (3) production of toxins; (4) an increase in cell-proliferation; (5) an exposure of the nerve-endings to irritation through destruction of tissue.

In these abnormal stimuli can be found an explanation for the increased activity in the secretory function of the sexual organs that causes an overproduction of semen, and in the presence of the inflammation that prevents emissions in the normal manner, by intercourse and sometimes nocturnal pollutions because of pain, an aid to overdistention of the seminal vesicles and prostate. This overdistention in turn, by increasing the pressure on the already hyperesthetic nerves of the sexual organs, adds to the frequency of erections and the severity of the congestion, both conditions act as hindrances to the successful treatment of the disease.

The protection that the massage at this acute period of gonorrheal infection offers to the post-urethra and prostate, is explained on the following grounds: (1) Congestion predisposes to inflammation; congestion is relieved. (2) According to Lydston, of Chicago, the ejaculation of the semen is accompanied by a syringe-like action on the part of the bulbo-cavernosa muscle that will aspirate the semen mixed with the anterior urethral secretion into the post-urethra and thus cause infection of the prostate.

The reader of Fuller's* logical and convincing applications of the principles of the mechanics of the heart to the sexual apparatus, will perceive in Lydston's statement, an extension of this principle to the bulbo-cavernosa muscles and therefore a theory of practical utility. If the anatomical facts are recalled, that owing to the curvature of the proximal end of the anterior urethra downward and backward, the glands of Leiter and the crypts of Morgagni, here have their openings directed backward, and on account of the same physical fact, their contents and any inflammatory secretion in this portion of the urethra will gravitate

toward the compressor muscle, one will perceive an additional factor (the accumulation of infectious material against the compressor muscle), increasing the percentage of cases of posterior urethritis and prostatitis, this syringe-like action of the bulbo-cavernosa muscles occurring.

Method of Conducting Massage of the Prostate in Acute Gonorrhea.—Patient first voids his urine in ignition tubes. The anterior urethra is then thoroughly irrigated by Janet's method with some hot mild antiseptic solution, such as potassium permanganate 1-6,000, protargol 1-1,000, etc., so as to render it free from the discharge, especially the proximal end previously referred to. Next the bladder is well filled with a solution of the same strength, a small quantity of which, sufficient to relieve the feeling of overdistention is at once voided into a glass urinal and saved for comparison with the remainder, which is retained in the bladder until after the massage is completed. The solution in the bladder mainly serves the mechanical purpose of cleansing the posterior urethra before and after massage and as an aid to massage, by distending the bladder so that when pressure is brought to bear upon it, with one hand, the prostate is brought near the massaging finger. The patient is placed upon the table upon his back, a towel placed under his buttocks, legs flexed and rotated outward, the heel of one foot being placed upon the instep of the other. The index finger of the right hand of the operator (a thin rubber glove is worn) is then well covered with vaseline. During inspiration, the index finger is inserted into the rectum. Then with the left hand pushing down the distended bladder, the prostate and seminal vesicles are thoroughly examined and then gently, not violently, stripped until they are emptied of their contents. In so doing the overdistended and congested seminal vesicles are relieved in a passive manner that will avoid the suction action of the bulbo-cavernosa muscle. Massage being completed, the patient immediately empties his bladder of its contents. And if any infectious matter does enter the posterior urethra from the anterior, or is squeezed from the prostatic ducts affected with an incipient form of prostatitis, it is at once washed out. As an additional protection against infection, the bladder, before dismissing the patient, is again washed with a normal salt solution, or preferably, a 4-per-cent. boracic acid solution. This injection once more cleanses the urethra and bladder, has some antiseptic value, and is of special service as it prevents the distressing tenesmus that occasionally follows intravesicular irrigations, and is to be avoided.

The frequency with which massage should be practised depends upon the patient's sexual habits and the rapidity with which the vesicles and prostate become distended. Usually once or twice a week is sufficient.

In conclusion, I will state that this paper is the result of a clinical observation of 54 cases of gonorrhea, 20 of which were acute primary gonorrheas and of 10 circumcisions (uncompli-

* Disorders of the Male Sexual Organs (Fuller), page 51.

cated by gonorrhea), 5 of which were massaged to prevent erections. Of the 5 massaged, none were troubled with erections. Of the 5 unmassaged, 3 were. With this number of cases, I consider my experience to date sufficient only to warrant the advocacy of this treatment of chorda verenea in the hope that time and the experience of others will demonstrate its practical utility.

ON THE REFLEX ERUPTIONS OF THE SKIN FROM MORBID ALTERATIONS IN THE MALE URETHRA.*

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THE diseased condition of the urethra is often the cause of reflex skin eruptions. In acute urethritis, we often meet with edema of the prepuce with lymphangitis, but these are not of the kind which we have under consideration. The balsamic erythema, which is found as a result of the ingestion of the oil of copaiba or of the santol, is only a remedial eruption and has nothing to do with the urethritis.

The affections of the skin which originate from chronic disturbances of the urethra, are of a reflex nature and can be reduced to herpes and pruritus.

Herpes.—Often a man complains of relapsing herpes progenialis, and he is unable to conceive the reason of the recurrence of the affection. The eruption, vesicular in character, appears suddenly in the form of small vesicles, five, six or more aggregated together, sometimes separated. They usually make their appearance in the sulco balano preputiale, around the frenulum and on the internal surface of the prepuce. Sometimes they will be found on the dorsum penis, and in some aggravated cases the vesicles may appear also on the scrotum. The appearance of the vesicles is preceded and also accompanied with a slight itching sensation. The vesicles are filled with clear serum, and their cover being very thin, easily breaks, and leaves round superficial excoriations, which have a yellowish surface, oozing a thin whitish serum. After five or six days, new epidermic cells are formed and in eight, ten or twelve days the excoriations are perfectly repaired.

It is not the importance of the affection which prompts the patients to seek medical attention, but the unceasing relapses, which cause great trouble.

In some cases the patient, having had suspicious intercourse, is greatly frightened from the possibility of a venereal or syphilitic lesion. Here comes the task of a physician to make his differential diagnosis between herpes and a venereal ulcer, or between herpes and mucous patches. This task, however, is simple and easy, so much so, that the doubt cannot remain long, when we consider the superficial character of the lesions, the

arrangement of the excoriations in a round disposition (recalling the vesicles) in a word, the appearance of the excoriation has nothing to do with the neatly cut edges and with the ragged surface of the bottom of the venereal chancre.

I hardly believe that an excoriation from a little crop of herpetic vesicles could ever impose for an initial syphilitic lesion and the doubt cannot last long. Rather an eruption of superficial mucous patches in the internal sheet of the prepuce, or in the sulco balano preputiale, may be mistaken for herpes. Mucous patches, however, are much deeper, as they are true papules, and, furthermore, they are scattered in different places, while the herpetic vesicles, being very superficial, have a tendency to aggregate and coalesce together in little crops. Of course it will be found that mucous patches are associated with general syphilitic manifestations; but we must consider that herpes can be found in syphilitic individuals. In this case the general symptoms of syphilis will tell us that the patient is syphilitic, but will not help any in the differential diagnosis between herpes and mucous patches. It is rather important in some cases to determine the exact diagnosis between the two lesions. Furthermore someone has also advanced the theory that recurrent herpes progenialis has to be considered as a result of a syphilitic diathesis, which I strongly deny.

A very important question is whether the excoriations resulting from herpes may open the door for venereal or for syphilitic infection. In this case we find patients, who, having been infected on their usual herpetic excoriations, refuse to believe the physician, when establishing the diagnosis of an initial lesion, for the reason that they have been quite often subject to herpetic eruptions.

The question of herpes progenialis must be studied from the point of view of its origin, so that we may be able to stop its persistent relapses. When we speak of herpes, we mean a vasomotor trouble, which means an irritation starting from the genital sphere, which through the sensitive filaments of the nerves is carried to the ganglionic cells in isolated ganglia, or to the spinal cord, and, this irritation of sensitive nature is changed in those cells, and from them is carried to the nervous filaments, which regulate the tonus of the blood-vessels. In consequence a hyperemia is produced at the end of the nervous filaments which, followed by exudation, form the vesicles, which we call herpes.

It is possible that vesicles are formed on account of a local irritation as is occasioned in consequence of venereal excesses, neither would I deny the possibility of the staphylococci contained in the vaginal secretion, which in some cases may be the cause of the herpes. But these are not permanent causes, and if capable of producing an herpes once, could not consistently be considered as the permanent cause of the persistency in the relapses of herpes progenialis.

The cause, therefore, must be of a permanent nature. In the beginning of my practice I have

* Presented before the Second Annual Meeting of the American Urological Association, New Orleans.

limited myself to the enquiries of the patients, whether they had suffered any urethral affection, but the reply had been always negative, and I have remained in the darkness in reference to the etiological reasons. Gradually I have adopted the system of making a thorough examination of the urethra and from a large number of patients, who have applied for treatment of herpes progenialis, I have found in every case a condition of chronic posterior urethritis with all its complications.

I cannot refer to each of the single cases under my treatment, it would require a long and tedious report. I will limit myself to a few cases of the most striking character. A man in very good general health came to me for a fresh case of subacute anterior gonorrheal urethritis. This was his second time, some seven years previously he had been affected with another case of a severe nature, which had lasted over a year.

The anterior urethritis very easily yielded to the irrigation treatment with a solution of permanganate of potassium 1 to 1,000. He complained, however, that for years he had been constantly annoyed with herpes, and that as soon as the old vesicles had healed up, new ones kept coming. The examination of the urine showed a few shreds in the first beaker, and some more in the second. The shreds under the microscope resulted of mucine, with many mononuclear and a few polynuclear leucocytes. Some large pavimental epithelial cells, and some amorphous granules of sodium urate. The staining with aniline dyes did not reveal the presence of gonococci.

My diagnosis was that of a chronic posterior urethritis, remnant of the old attack.

In order to see whether any material alteration had taken place in the mucous membrane of the urethra, I passed an ordinary steel sound No. 12, which was easily introduced, but it showed some difficulty while withdrawing it. This was enough to give me the idea, that there was an infiltrated point in the bulbar region of the urethra, a kind of a wide stricture. In removing the sound a little drop of whitish fluid came out like we see in those cases.

For the purpose of washing and sterilizing the urethra I made a deep irrigation with the solution of permanganate of potassium 1 to 2,000. In letting out the solution a mass of thick mucus of stringy appearance came out from the urethra.

From the application of the instrument in the urethra, the patient suffered a recrudescence of the urethritis, and one day after an attack of fever. This of course required the intervention of internal remedies, and quinine was administered, which removed the fever, and cleared also the urine considerably. After a few days I resumed the irrigations with a mild solution of permanganate every two days, but no more mucus was seen. The patient had no more discomfort, and gradually was discontinuing the treatment. The most important feature in the case was that the herpetic eruption had not been seen since.

Some three months after he came back with another attack of herpes in the internal surface of the prepuce. I repeated the irrigations with the Valentine apparatus, and after several attempts, another mass of mucus came out, of the same quality like that of the first time. For this reason I began the use of sounds regularly once a week together with the urethral irrigations. Neither the herpes nor the mucus appeared again. Lately his urethra could bear the introduction of No. 15 sound, which was passed once a month.

In my opinion I believe that in his urethra had been formed an enlargement in form of a cul-de-sac, above the bulb, and there some mucous secretion had found its receptacle. The sticky quality of the mucus, and its place, prevented the urine from removing it, by the act of the mic-turition, and in consequence it had accumulated to a certain quantity. The presence of the mucus, made more irritant by the urine and by its salts, was a sufficient cause to produce irritation on the sensitive filaments of the internal pudenti, and the herpes was the result. In nearly every case of recurrent herpes progenialis in the man, I have found the reason of its persistency in the altered condition of the urethra. In some cases herpes has had its reason of existence in the abnormal condition of the glands of the mucous membrane of the urethra. In some cases I have found the glands of Guerin affected. These two small glands, which are seated on both sides of the urethra underneath the fossa navicularis, have their excretory ducts near to the meatus. The gonococci sometimes find their way from the excretory ducts to the glands, which are affected with chronic inflammation. These glands in this diseased condition can be felt under the exploring fingers like two shots on both sides of the urethra near the frenulum. Although the urethra is nearly well, yet the patient complains of a kind of uneasiness, and an itching sensation near the meatus, toward the fossa navicularis, which compels the patient to squeeze that region, bringing out a little moisture, which relieves the itching. In consequence of this affection I have seen quite often crops of herpes progenialis around the sulco balano preputiale, and on the internal sheet of the prepuce, consequent to the irritation from the inflamed condition of these glands.

It is therefore necessary, in cases of relapsing herpes, to bring our attention to the condition of the urethra and of its glands, which quite often are the cause of the persistence of the herpes.

The pathological anatomy of the herpetic vesicles has not much interest, as it is the same which we find in any other vesicular eruption. It is an exudation of the serum of the blood from the capillaries of the papillary layer, with some mononuclear and a few polynuclear leucocytes, which effused in its meshes finds its way into the layers of the epidermis. The effusion of serum by its pressure detaches the horny layer of the epidermis, which being more resistant is raised up in round shape forming the cover of the vesicle. The size and depth of the vesicles depend

upon the intensity and degree of the hyperemia, which is the direct consequence of the vasomotor disturbance.

The local treatment of the herpes is very simple, usually washing with soap and water, and when dry, the application of absorbent powders, talcum, rice, oxide of zinc, bismuth, etc., afford good results. When there is some necrotic condition of the epithelial cells forming the bottom of the excoriation, I touch up the surface two or three times with a solution from 3 to 5 per cent. of nitrate of silver.

I do not advise the application of salves, which in the sulcobalano preputiale become altered and cause irritation, rather than benefit. I have seen that some physicians have resorted to the circumcision for the purpose of preventing the relapses of the herpes. This operation, however, has never been of any benefit whatever, the herpes instead of coming on the prepuce was coming on the glans and on the skin of the penis. In these kind of cases and for this purpose I consider the circumcision an entirely useless operation.

Pruritus.—Another reflex skin trouble is pruritus, which may affect the anus, perineum and scrotum. In most cases we find these regions affected with eczema, excoriations and rhagades. In these cases I consider the eczematous affection as a secondary one, produced mostly by the action of scratching and rubbing by the patient, in order to stop the itching sensation. The skin around the anus is red, swollen, thickened, like leather, showing excoriated places oozing serum, the folds around the anus are somewhat more pronounced, swollen and when the skin is distended rhagades are found. The irritation from scratching is often spread to the mucous membrane of the rectum causing a mucous discharge.

Those cases are usually diagnosed as pruritus and eczema. Often it is doubtful to which has to be given the precedence; both diagnoses are right, but I firmly believe, that pruritus is the first, and eczema is only the consequence of the wounds and of the irritation produced by scratching.

The cause of pruritus must be looked for in the condition of the urethra, and according to my observations the reason is found in the prostatic region. When the posterior urethra is affected, as a consequence the prostate is also swollen, enlarged and dilated. In many cases the urine is turbid, cloudy, sometimes contains shreds, long, stringy and tortuous, showing their origin to be from the follicles of the prostatic gland.

In these cases the examination of the urethra through a sound is necessary, to ascertain the presence of strictures, and it is also necessary to introduce the index finger into the rectum, to ascertain the condition of the prostate and of the seminal vesicles. In nearly all of my cases of pruritus I was able to find either both lobes of the prostate, or only one lobe, more often the right, swollen, thickened, or bulging up like a cyst. When the prostate is pressed, two or three drops

of mucus came out of the urethra, which under the microscope contains the brilliant bodies of the prostatic glands. That mucus results of the chronic inflammation of the prostatic region, coming out of the follicles, is cause of an irritation, which affecting the sensitive nerve fibers, which so numerous surround the prostate, cause the itching sensation.

The nerves of the prostate and of the urethra proceed from the distribution of the pudendus internus, which forms an admirable network of nervous filaments. Moreover, the prostate is entered and surrounded by a plexus, which is known as the prostatic plexus, belonging to the great sympathetic system.

It is therefore clear that any disturbance of this region, affecting the different filaments of the sensitive nerves will be revealed with perversion of the sensitiveness (*pruritus*), and when affecting the sympathetic system will be revealed with morbid manifestations of the vasomotor sphere, erythema, formation of vesicles, herpes.

Sometimes the effect of the irritation does not remain limited to the locality, but it is carried through the nerve fibers to the spinal centers and from there up to the sensitive ganglia. These are the causes which we find quite often in cases of sexual neurasthenia. Cases of this kind come quite often under the treatment of the general physician, or of a neurologist as cases of simple neurasthenia.

It is my intention to limit my observations to the locality, and to the local pruritus, but I cannot neglect to mention cases of general pruritus proceeding from the same cause. A medical gentleman was under my care only a few days. He had a case of chronic prostatitis in consequence of a neglected blenorrhagia, and he was suffering with an intense pruritus of the anal and perineal region, which was relieved only by massaging the prostate. When he remained without treatment of the urethra and of the prostate, his sufferings were greatly increased, and the pruritus affected the backs of both hands, both arms, both feet and the calves of both legs. The itching was so troublesome, that the gentleman although he tried hard not to scratch, yet during his sleep scratched so severely as to produce deep and extensive excoriations. It is not entirely out the reach of an explanation the possibility of the generalization of pruritus not only, but also of an eczematous eruption, when we recollect, that the skin is a continuous involucre covering the whole body in connection with the mucous membranes, with innumerable vasal and nervous anastomoses. The prostate which is a glandular organ in intimate connection with the urethra, resembles somewhat a chestnut or a heart of the playing cards. It rests upon the aponeurosis mediana of the perineum and on the membranous portion of the urethra. Its upper portion, where the bladder rests is somewhat concave, and is intimately connected with the vesical tunics. Its inferior portion is connected with both deferent canals rest-

ing on the median line. The anterior portion of the prostate is in contact with the upper perineal aponeurosis, and the posterior is separated from the rectum only by the prostatoperineal aponeurosis, in consequence it is so easily felt by the exploring finger introduced into the rectum. It is an organ consisting of strong muscles and glands intimately connected with the posterior wall of the urethra, so that it is difficult to isolate the prostate from the urethra, which is firmly imbedded into its structure. The ejaculatory ducts, which are the continuation of the deferent canals go through the gland obliquely from backward to forward and from externally toward the middle, ending nearly together. The mass of glands forming the prostate ends in 10 or 12 excretory ducts, which open into the urethra on both sides of the verumontanum. In consequence of the spreading of the blenorrhagic process into the glands, we have only rarely cases of general gonorrheal prostatitis, which may end in an abscess with dangerous consequences. In the ordinary cases we have subacute or chronic prostatitis, which is noticed by the patient at the end of the micturition by a painful tenesmus at the time of squeezing out the last few drops of urine. Sometimes these last drops of urine are accompanied with thick mucus, or even with a few drops of blood.

Other times the process is much milder and the patient although annoyed by frequent micturition and sometimes also by night emissions, yet permits the thing to run without medical attention, alleging all the different explanations which the imaginative talent of the patient can only find. The inflammatory process, although of a catarrhal nature, increases the secretion of the prostatic glands, which sometimes oozes out in form of a sticky, clear albuminous fluid, as prostaticorrhea, at other times on account of some difficulty to its issue is retained in the glands, causing their dilatation. It is in this way that we find the lobes of the prostate enlarged, and as I have already mentioned, to such an extent in some cases to give to the exploring finger a sensation like that of a cyst. I scarcely need to say that when the glands of the prostate are so inflamed and enlarged the surrounding connective tissues take a hand in this enlargement and in the congestion of the whole organ.

From the above considerations I find that pruritus of the perineum is explained by the irritation produced upon the sensitive fibers of the nerves, which are so abundant in that delicate region, from an accumulation of abnormal secretion, in the lobes of the gland.

Treatment.—It is easy to understand that the eruptions already mentioned or the pruritus will be of persistent character, as the anatomopathological alterations, which produce it are of a permanent nature. The massage of the prostate, or what is more often called the stripping of this gland, is of a great benefit for the reason of removing the secretion from the body of the glands, diminishing the distention. In conse-

quence the massage of the prostate has been rightly recommended as the chief means to relieve this condition of chronic prostatitis.

I would not, however, rely entirely on this simple application, and I find that together external and internal applications are necessary. In my practice I cannot renounce to the irrigations of the entire urethra and bladder, through the Valentine apparatus, using a mild solution of permanganate of potassium or bichlorate of sodium, repeated two or three times a week. In case of infiltration, or hardening of the mucous membrane of the urethra, the introduction of a sound covered with salve composed of 25 per cent. ichthyol in vaseline has given in many cases good results. This application, however, cannot be done more than once a week, and the operator must be cautioned that the prostatic urethra when inflamed quite often reacts very severely after one of these applications. For this reason we will advise our patient after the application of the fenestrated sound with ichthyol salve, to remain in bed for several hours, and in case of pains to apply hot water bag on the perineal region. To diminish the disagreeable tenesmus, the administration of the usual remedies as bromide of potassium, hyoscyamus, opium, trional, etc., come very handy and usually beneficial.

Locally the use of the ichthyol has given me the best results to stop the itching sensation and to heal up the results of the scratching, excoriations and eczema. I use my old liniment resulting of ichthyol, 3ij; aq. calcis, olii amygd. dulc., 3iv; aq. rosæ, glycerin, aa 3vj; m. f. linim. This is applied on cotton or English lint, and it is left on for the whole night, in the morning it is washed with a solution of carbolic acid, according to the following formula: Acid. carbolic., glycerin. aa 3j; aq. rosæ, alcohol. aa 3iij. M. ad us. Ext. as washing.

In case of complication of the mucous membrane of the rectum to the eczematous process, I advise my patient to use injections with a very weak solution of borate of sodium, at a warm temperature into the rectum twice a day, and by means of a speculum ani I introduce a small tampon of cotton saturated in 25 per-cent. solution of ichthyol in glycerin which the patient holds in, so long as he can. In my experience, ichthyol has an astringent action upon the prostate and on the vas deferens in case of its complication.

After the excoriations have healed up, and the eczema is improved, the itching sensation has also diminished, I advise the application of an ointment with oxid. of zinc, for instance, the modified formula of Wilson: benzoin, 5; vaselin, 70; zinc oxid, 25. When the skin has returned to the normal condition, the patient will finish his treatment, by bathing the perineum and scrotum with the carbolic acid lotion, and when dry, will cover the skin with rice powder or amyllum. In case of presence of strictures, I continue the use of the sound for a long time, according to the feelings of the patient, and to the quantity of mucus, which

comes out after withdrawing the sound. Its application will be repeated every two or three weeks and also once a month, until no more mucus comes out after the application of the sound.

It would be tedious and perhaps useless for me to relate a description of a series of cases of the kind, where I have obtained satisfactory results with the mentioned treatment. I can only state that with patience and perseverance I have obtained with this method gratifying results in cases of many years' standing, cases neglected and left nearly to themselves without rational treatment.

THE TREATMENT OF SOME DISEASES OF THE EYE BY WARM MEDICATED SPRAYS.

BY DAVID T. MARSHALL, M.D.,
OF NEW YORK.

FOR the past year I have been making use of an old, but seemingly little known, method of treating certain diseases of the eye; namely the use of warm medicated sprays applied by means of a steam atomizer.

The method is simply this: a steam atomizer, such as is commonly used in spraying the throat, is filled with water, the alcohol lamp is lighted and a solution of the remedy indicated is put in the cup.

The patient is seated in front of, and close up to the atomizer, at such a level that his eye looks directly into the tube. When the spray is well started the lower eyelid is pulled down and the patient is directed to hold his eye wide open. The spray is directed alternately into one eye and then into the other, the duration of the treatment being from five to ten minutes. After spraying, the eye may be touched with bluestone or alum stick or applications of drops or ointment may be made as is indicated. These agents seem to act more effectively when applied immediately after the warm spray.

Cases of blepharitis marginalis heal with surprising rapidity after a course of spraying and yellow oxide or other ointment. As this disease is often complicated with, if not really caused by, a conjunctivitis more or less chronic and often trachomatous, it gets well because the conjunctivitis is healed at the same time. In practice it is very difficult to get blepharitis patients to remove the crusts from their eyelids. Unless this is done ointments do not act effectively. The hot spray softens the crusts and they may be removed while the spray is being applied. In this connection I may state that blepharitis cases often do better with ointments other than the classic yellow oxide. I have gotten good results with Lassar's paste, resinol ointment, boric acid ointment and even plain vaseline after yellow oxide in one-half- to one-per-cent. strength had been used for weeks, to no purpose. It is idle to scold the parents of the average clinic child because they fail to remove the crusts from their child's eyes. It is better to make use of a treatment which will cure

the child's eyes in spite of the ignorance or carelessness of its parents.

Chronic conjunctivitis responds most satisfactorily to treatment with the warm spray. The spray is soothing and pleasant and patients enjoy taking it. Most cases of conjunctivitis do well under bluestone applied immediately after the spray. I apply it lightly to the lower lid and then let the patient bathe the eyes in a basin of cold water until the acute pain is somewhat abated.

Of all cases in which I have used the spray treatment, the most satisfactory have been some chronic cases of conjunctivitis and pannus, combined with more or less corneal infiltration due to old trachoma. We see many such in the dispensaries in New York. They are found principally among the poorer classes of Russian Jews, many of whom are tailors and work in poorly lighted and poorly ventilated sweat-shops. The plight of these people is sometimes pitiful in the extreme. They are compelled through poverty to work when their eyes are totally unfit to use. Some of them give a history of having had trachoma, with occasional attacks of pannus, for periods varying from five to thirty years.

Where the corneal irritation is due to the rubbing of roughened cicatricial surfaces of the eyelids, little can be done. In cases where the conjunctiva of the eyelids is swollen and succulent, the spray treatment, followed by applications of bluestone, is very effective. I have relieved a number of such cases, which had been treated with bluestone or nitrate of silver for months with no improvement.

Corneal ulcers and infiltrates often clean up rapidly under the spray treatment.

A method of treating chancroids by means of a weak spray of peroxide of hydrogen, applied by means of air at a pressure of 60 pounds to the square inch, has recently been suggested. I believe that a warm spray of a suitable solution applied with considerable pressure would favorably influence a corneal ulcer, but I never have tried it.

The pressure of the warm spray as it issues from the tube of the atomizer is practically inappreciable, but it cleans out an ulcer effectively.

Summary.—Spraying with warm medicated sprays is indicated in almost all diseases of the conjunctiva, as acute catarrhal, chronic, epidemic, gonorrheal, trachomatous and phlyctenular conjunctivitis; in diseases of the cornea as ulcer; infiltration and interstitial keratitis, and in iritis.

33 West Twelfth Street.

Isopral, a New Hypnotic.—Isopral, a chlorated propyl alcohol, forms a crystalline body readily soluble in water, alcohol and ether, and possesses a camphoraceous odor and aromatic pungent taste. Its physiological action has been carefully studied by D. IMPENS (Therap. Monatsheft., Sept. and Oct., 1903), who finds that while less poisonous than chloralhydrate, it resembles this in action and is at least twice as efficient. Cardiac depression is less marked, respiration is only affected with tonic doses, and locally it possesses distinct anesthetic properties, though irritating at the same time. In doses of 0.5 to 0.75 gm. (8 to 12 grains), it is as efficient as chloral and it has no after-effects.

MEDICAL PROGRESS.

PHYSIOLOGY.

Mechanism of the Absorption of Cocaine Injected into the Spinal Canal.—The anesthesia following rachidian injections of cocaine, according to A. VALENTI (Arch. Ital. de Biol., Sept. 10, 1903), is to be attributed exclusively to this alkaloid, which, remaining for a long time dissolved in the spinal fluid, acts locally upon the origins of the spinal nerves, paralyzing their sensory fibers. The secondary postoperative phenomena, analogous to those of acute cocaine poisoning, depend upon the toxic action of the alkaloid, which, on account of the late absorption by the lumbosacral arachnoid, passes very slowly into the circulation. It will require further researches to establish the fact, whether the very slow absorption of cocaine in these conditions, might not have a special influence upon the intensity of the toxic phenomena, which, following the hypodermatic injection of corresponding doses, seem to be less constantly manifested.

Macroscopic Modification of the Blood Preceding Coagulation.—A new phenomenon, visible to the naked eye, has been observed by V. DUCCESCHI (Arch. Ital. de Biol., Sept. 10, 1903) in a few drops of blood obtained from the finger-tip, and placed in the center of a watch-glass; after inclining the latter repeatedly at intervals of several seconds, and then holding it up to the light, there are noticed in the depth of the blood next to the glass a number of very fine whitish points or granules contrasting markedly with the blood. These appear within from forty seconds to two minutes after the blood is removed from the body, and rarely later. The granules usually have a diameter of from $\frac{1}{4}$ to $\frac{1}{2}$ mm., and are no longer visible when coagulation sets in. Mixing the blood with an equal quantity of a one-per-cent. solution of ammonium oxalate prevents the formation of the granules. If the granulations be placed on a slide, dried in the air, fixed with a mixture of alcohol and ether and stained with one-per-cent. methylene blue, they acquire a diffuse blue color containing small prints of a deeper blue. The surrounding red blood cells have a greenish hue. Under the high power of the microscope, the bluish masses are recognized as clumps of blood-platelets, more or less altered, and of a smaller number of leucocytes whose nuclei stain much more distinctly than the platelets. If the granules be examined during the early stage of their formation and while they are rather small, it will be seen that there is little or no fibrin; the entire phenomenon, therefore, is one which precedes coagulation. If a beaker be nearly filled with the fresh blood of a rabbit, it will be observed that the granules form not only at the bottom, but also along the side, provided the blood be kept in motion by inclining the beaker several times; in blood which has been kept perfectly quiet the granules appear in but scant number. It is well known that the blood-platelets have a tendency to adhere to surfaces other than those of the normal wall of the blood vessels, and to gather in clumps. This phenomenon may be regarded as genuine agglutination, and is held by some authors as distinct, morphologically and physiologically, from coagulation. It will be interesting and perhaps of practical value in clinical medicine, to investigate the possible variations of the above phenomenon in various morbid conditions, inasmuch as a few investigators have observed marked oscillations in the number and even the complete disappearance of the platelets in various diseases.

Corpuscle of Poggi in the Hematopoetic Organs of the Premature Fetus.—Poggi deserves the merit,

according to G. ZIBOLLA (Arch. Ital. de Biol., Sept. 10, 1903) for having been the first to discover in the blood of anemics, a corpuscle which has the property of staining freshly with methylene blue, and which the discoverer regards as an immature element or one which has precociously escaped into the circulation. This belief is based upon the fact that the corpuscles of Poggi are normally found in large quantity in the bone-marrow, the seat of the manufacture of red-blood-cells. The author has demonstrated that they are also found constantly in the hematopoetic organs of the premature fetus of man and the other mammals. The presence of these corpuscles in embryos which have not arrived at maturity or which do not attain extra-uterine life, or which have lived but a short time in the uterus, in a small proportion in the bone-marrow, and in a large proportion in the spleen and liver, suggested to the author the thought that these are newly formed elements which have not yet arrived at physiologic maturity.

Gastric Glands Under Conditions of Lethargy and Activity.—In an investigation of the gastric glands of the marmot, with regard to their microchemistry the lethargy of winter and the activity of summer, R. and A. MONTI (Arch. Ital. de Biol., Sept. 10, 1903) reached the conclusion that the delomorphic (acid) cells elaborate the hydrochloric acid in a very dilute solution, and eliminate it as rapidly as it is produced. This function is completely suspended during the lethargy of hibernation. On the other hand, the chief (peptic) cells elaborate pepsinogenic granules which slowly accumulate and are rapidly eliminated at the beginning of digestion.

Laws Governing the Secretion of the Aqueous Humor.—The physiological mechanism by which the aqueous humor is produced, resides, according to A. ANGELUCCI (Archives Ital. de Biol., Sept. 10, 1903) in the parietal cells of the uveal capillaries. Section of the vascular nerves changes the function of these cells in such a manner that, at first, the lymph secreted is quantitatively diminished, while its chemical composition approaches more closely to that of the plasma of the blood. Strong electric and mechanic shocks imparted to the vascular fibres of the fifth nerve and the cervical sympathetic, produce nearly the same effects as division of the nerves; the albuminous content of the aqueous humor increases, and there is augmented intra-ocular tension. Lesions and irritations of the surrounding tissues, particularly of the cornea, and of the anterior part of the uveal tract during paracentesis, have the same effect as section and powerful irritation of the vascular nerves, increasing the quantity of albumin and imparting a fibinous character to the aqueous humor. The above changes are attributed to the disturbance of the physiological equilibrium existing between the vascular nerves, the surrounding tissues and the capillary wall.

Transformation of Caffeine and of Xanthine into Uric Acid.—Caffeine and the other methylated xanthines are transformed in the animal organism, gradually losing their methyl groups, according to A. VALENTI (Arch. Ital. de Biol., Sept. 10, 1903). The close affinity between xanthine and uric acid, brought to light by Fisher's research on the purin group, suggested to the author that possibly following the administration of caffeine, the xanthine group contained in the latter would be oxidized in the body into uric acid. If this be the case, then the higher methylated xanthines forming a considerable part of the diet of civilized people, in the form of tea, coffee and chocolate, might be considered as sources of uric acid. The author found that xanthine administered to a pigeon, is largely oxidized into uric acid, as has already been proved in the case

of hypoxanthine. He also found this to be the case with caffeine. This fact is of possible importance, for it affords a theoretical basis for the exclusion of coffee and its relatives from the diet of those subject to the uric acid diathesis. The author demonstrated that, at least in the ox, the liver is the seat of the transformation of large quantities of xanthine artificially administered.

Nature of the Physiologically Active Substances in Extracts of Nervous Tissues and Blood.—There are two groups of substances in watery extracts of nervous tissues, which, when injected into the veins of an animal, lower the blood-pressure, according to S. VINCENT and W. CRAMER (*Jour. of Physiol.*, Nov. 2, 1903). Both of these are soluble in water and in normal saline solution (NaCl .9 per cent. in tap water). One group is easily soluble in absolute alcohol and the other scarcely soluble in this fluid. The alcoholic solution contains two depressor substances; one of them has its effect abolished by atropine, the other has not. The latter is the more powerful, but rather the less soluble in alcohol. The alcoholic solution gives an abundant precipitate with platinum chloride. Only a small part of this is readily soluble in water and on purifying gives octahedra and prismatic crystals. The greater part of the precipitate consists of potassium and ammonium platinum chlorides. The octahedra are the ammonium salts. The prisms have a platinum percentage of 32.8 corresponding to the platinum double salt of di-choline anhydride. The authors have not found any choline as such in brain extracts, but there is evidence that this substance exists in nervous tissues in the form above mentioned. The chemical and physiological tests recommended for choline in pathological blood cannot be relied upon; indeed, normal blood gives both the octahedra and frequently also the depressor effect.

Physiological Action of Betaine Extracted from Raw Beet-Sugar.—In a series of experiments made with a different object in view, A. D. WALLER and R. H. ADERS PLIMMER (*Proc. of the Royal Soc.*, Oct. 31, 1903) noticed that syrups made with ordinary beet-sugar had a faint cadaveric odor reminiscent of choline and neurine solutions, and the suspicion was aroused that the taint of the samples in question might be due to the presence of betaine or of allied alkaloid. On investigation, Plimmer found this actually to be the case. In experiments upon cats and dogs they found that the hydrochloride of betaine injected into a vein acts directly upon the heart and that commercial betaine (Merck) is more powerful than betaine extracted from beet-sugar. In all instances the mode of death has been by cardiac syncope from which no recovery could be obtained by artificial respiration. With sublethal doses the characteristic effect was a temporary fall of blood pressure, with a slight augmentation of the respiratory movements. It appears that betaine in considerable quantity (3.75 per 1,000) is present in raw beet-sugar.

Proteolytic Enzymes of the Spleen.—The most fruitful fields for physiological research to-day seem to be the domain of the various animal enzymes. S. G. HEDIN (*Jour. of Physiol.*, Nov. 2, 1903) finds in the spleen of the ox two proteolytic enzymes, the one (α -protease) acting only or principally in an alkaline medium, and the other (β -protease) acting only or mainly in an acid medium. The β -protease can be obtained in solution by digesting the spleen with very weak acetic acid, and the α -protease (together with β -protease) by extracting the residue, with sodium chloride solution, dialysing and precipitating with weak acetic acid. The precipitate contains both

enzymes. Both enzymes have been obtained in two forms: Combined with nuclein substances in which case they are not soluble in weak acetic acid; and not combined with nucleins, and therefore soluble in weak acetic acid. The form not soluble in weak acetic acid can be obtained from the soluble form by adding a nuclein substance and acetic acid in absence of salt. Ox-serum contains antibodies of the α -protease, but not of the β -protease. The spleen enzymes are in all probability contained in the leucocytes of the spleen, and there they may perform their functions. There they may affect the metabolism of the nitrogen inside the cells, and they may also have something to do with the digesting processes, which, according to the view of Metchnikoff take place inside these cells during the phagocytosis. As to the significance of the β -protease, it should be remembered that the acid reaction required for its activity according to investigations carried out by Ehrlich and particularly by Metchnikoff and his pupils occurs at some places inside the leucocytes. Thus the reaction of the nuclei is considered to be acid, and the digestion of bacteria and other substances taken up by the leucocytes in most cases takes place inside the so-called digesting vacuoles, where the reaction as a rule is acid. Whether the spleen enzymes may be active outside the leucocytes as well as inside is a question which cannot be settled at present. It does not seem to be impossible that the enzymes could leave the cells either by an act of secretion or perhaps by digesting some of the cells. Similar or perhaps identical enzymes seem to be present in several organs, although not in such amounts as in the spleen, and there may be proteolytic enzymes in the blood, although their activity may be checked by antibodies. Therefore, the author does not think that the spleen enzymes should at once be ranked with the so-called intracellular enzymes.

Proteolytic Enzyme in Ox Serum.—A weak proteid-digesting enzyme, acting in an alkaline medium, has been discovered in the serum of the ox by S. G. HEDIN (*Jour. of Physiol.*, Nov. 2, 1903). The easiest way of obtaining it is to precipitate it together with a nuclein substance, e.g., casein. Antibodies prevent the enzyme from acting in the serum. These are mainly contained in the albumin fraction. The enzyme may possibly be derived from the leucocytes in the blood or in other organs either by a destructive process, which might set the enzyme free, or by an act of secretion.

New Researches in Phosphocarnic Acid.—This phosphorized substance to which has also been given the name nucleone, is, according to A. PANELLA (*Arch. Ital. de Biol.*, Sept. 10, 1903), a regular constituent of striated muscle, urine, heart, liver and kidney of various animals. The author has also discovered its presence in the brain. It is more abundant in the muscles of the rabbit than in those of the dog. It diminishes after death in direct ratio to the appearance and establishment of rigor mortis. After the latter has disappeared, the acid increases progressively with the commencement and course of putrefaction.

Action of Choline, Neurine, Muscarine and Betaine on Isolated Nerve and Upon the Excised Heart.—A careful series of experiments was undertaken by A. D. WALLER and Miss S. C. M. SOWTON (*Proc. of the Royal Soc.*, Oct. 31, 1903), with a view of comparing the physiological action of the above four members of the ptomaine group of organic bases. These substances are closely related, as the following formulae show: Choline, $C_5H_{12}NO_2$; neurine, $C_6H_{14}NO$; muscarine $C_6H_{13}NO_2$; and betaine, $C_5H_9NO_2$. The action of snake venom, diphtheria toxin and tetano-toxin was also investigated. Pure neurine non-

neutralized was found to be very toxic to nerve. Betaine, as regards its direct effect upon nerve, is moderately active, i.e., the electromobility of nerve, as evidenced by the negative variation of its current of injury, is abolished by betaine and restored by subsequent prolonged immersion in physiological saline. Muscarine has a similar effect, but rather more pronounced. A comparison of the four substances was made by taking four nerves, as nearly similar as possible, and passing them simultaneously through each of the four test solutions and through physiological saline. The negative variation of nerve 1 immersed for seven hours in muscarine, was completely and permanently abolished. That of nerve 2, for seven hours in betaine, was temporarily abolished. That of nerve 3, after seven hours in choline, was unaffected, and after twenty-seven hours diminished. That of nerve 4, in neurine for seven hours, was temporarily abolished and permanently diminished. Decomposed cerebrospinal fluid and decomposed serum-albumin temporarily abolished the negative variation of the nerve after an immersion lasting one and a half hours. Snake, diphtheritic and tetanus toxins also caused temporary abolition. Neurine, choline, muscarine and betaine (as hydrochlorides) bring about diastolic arrest of the heart. The arrest thus produced is antagonized by the sulphate of atropine. Neurine and muscarine, in this respect, are more active than betaine or choline.

A Few Reflections on Parthenogenesis.—A number of reasons which he thinks call into question the possibility of parthenogenetic reproduction of bees (e.g., the development of the drones from unfertilized eggs), are advanced by E. PFLÜGER (Pflüger's Archiv, Sept. 23, 1903). The current teaching is that from unfertilized eggs there develop only drones; that the latter never develop from fertilized eggs; the drones can never reproduce male bees, but always have female descendants. The author interprets these statements as showing that the drones are only incomplete males whose testicle is endowed with but one-half of the necessary potency. He therefore concludes that the other half is present in the queen bee, which possesses the testicle necessary to reproduce males, and is, therefore, an hermaphrodite. In fact, hermaphroditism has already been observed in bees and butterflies.

Permeability of the Bladder.—Inasmuch as there has been a marked difference of opinion among investigators as to whether the wall of the bladder has any resorptive power, G. FASOLA and G. GALEOTTI (Archives Ital. de Biol., Sept. 10, 1903) decided to explore this subject anew. Their experiments consisted in the injection into the bladder of dogs in which the ureters had been tied, of definite quantities of known solutions, and then measuring these after the lapse of a certain time. In other cases the vesical epithelium was beforehand altered by chloroform. They found that in the latter, the epithelium of the bladder acts as an inert semi-permeable membrane separating the blood from the contents of the organ. Across this membrane the osmotic equilibrium is soon established. There are no histological lesions accompanying the action of the chloroform employed, hence its effect is purely functional. In general, in the case of epithelium not acted upon by chloroform, the osmotic equilibrium is not established, and the vesical wall acts according to the physiologic necessities of the organism. In the case of hypotonic solutions, there is no variation either in volume or in concentration. With isotonic solutions there is no variation in the liquid injected if the animal has been well supplied with food and drink, but there is a partial absorption if the animal has been hungry or thirsty. In the case of hyper-

tonic solutions there is a considerable absorption of sodium chloride. It follows that the bladder epithelium, at least of the dog, is permeable to either salt or water. The authors believe that the physiological significance of the resorptive power of the bladder with respect to sodium chloride lies in the fact that the organism finds it necessary to economize the chlorides: A great loss of this substance in a concentrated urine is obviated by its return to the circulation by way of the vesical wall. This permeability with respect to sodium chloride is a functional property of the epithelium of the bladder, a property which is suspended by the action of chloroform; for in the former case, osmosis occurs only one way, from the bladder to the blood, whilst in the latter case the osmotic flow is in both directions, leading to an equilibrium.

THERAPEUTICS.

Atropine and Hyoscyamine—A Study of Optical Isomers.—The relationship between the physical chemistry of various drugs and their physiological action is coming more and more to the foreground. A. R. CUSHNY (Jour. of Physiol., Nov. 2, 1903), finds that pure atropine and hyoscyamine act in the same way, and with equal potency on the central nervous system in mammals, and on the heart and terminations of the motor nerves in the frog. Atropine possesses a more powerful (stimulant) action on the reflexes of the spinal cord in the frog than hyoscyamine. The latter is almost twice as powerful as atropine in its action on the nerve ends in the salivary glands, heart and pupil. On the ground that the action of atropine is the resultant of the action of equal amounts of levo-hyoscyamine, the natural base, and dextro-hyoscyamine, these facts are interpreted as indicating that dextro-hyoscyamine has a more powerful action on the spinal cord than levo-hyoscyamine, while it has very little effect on the peripheral neurons mentioned. The examination of the action of dextro-hyoscyamine on these neurons proved this to be correct. Some organs have the power of differentiating between optical isomers, while others seem to be devoid of this power.

Strychnine in the Treatment of Sciatica.—At the present time we resort to many methods in the treatment of sciatica, such as massage and gymnastics, hydrotherapy, electricity, internal and external medication, is made without benefiting the patient in many of the cases, although here and there may be seen a case in which one or the other method of treatment may be useful. TH. O. ZARZYN (Roussky Vrach, Oct. 11, 1903) reports nine cases in which he resorted to the hypodermic use of strychnine, in 4 of the cases all the symptoms disappeared rapidly; 3 showed only considerable improvement, and this notwithstanding the very frequent injections of the drug; the other two were not influenced by the drug. The author is inclined to consider the hypodermatic employment of strychnine as the best method of treatment we have at present for sciatica.

The Action of Apocodeine.—This substance is an alkaloid obtained with some difficulty by the dehydration of codeine and it bears the same relationship to codeine that apomorphine bears to morphine, according to W. E. DIXON (Jour. of Physiol., Nov. 2, 1903). He finds that it very readily paralyzes nerve cells in exactly the same way as nicotine, but differs from the latter in that there is no initial stimulation. After the nerve cells have been paralyzed by apocodeine, nicotine on injection produces none of its usual effects such as rise in blood-pressure, vaso-constriction, etc., while the action of adrenalin remains unimpaired. As a result of this paralysis, arterioles dilate, blood-press-

ure falls, the heart beats more rapidly, and the automatic movements of plain muscle are all increased. Recovery is very slow. It is suggested that the increased peristaltic movements produced by the injection of many of the opium alkaloids and their derivatives is due to depression of the inhibitory sympathetic nerve cells. In a series of four of these alkaloids the purgative action varies directly with their paralytic effect in sympathetic ganglia. Reflexes are increased and strychnine-like convulsions are even sometimes seen. This is probably an effect on the sensory side of the cord. It is also suggested that nicotine directly stimulates the motor nerve cells in the cord, and that adrenalin diminishes resistance to impulses, especially in the motor side of the cord. Larger amounts of apocodeine paralyze the motor nerve endings in voluntary muscle like curare. The vagal endings in the heart are paralyzed as in the case of atropine. With still bigger doses after a preliminary stimulation, paralysis of vasomotor nerve-endings is produced. When this action is complete pilocarpine, physostigmine and adrenalin have no effect on the blood-vessels or blood-pressure, whilst barium and digitalis will still constrict the vessels and raise the blood-pressure. The effect of digitalis is, however, considerably diminished. The former three drugs therefore act on nerve-endings, and the latter two directly on muscle. The motor and inhibitory nerves to the intestines are paralyzed and, therefore, adrenalin and pilocarpine have no action. Other nerve-endings such as the hypogastries are not affected, and adrenalin still produces its normal inhibition and pilocarpine some augmentation of movement. The accelerator nerve-endings in the heart are paralyzed. This effect is relatively easy to produce in the young animal. Adrenalin, caffeine and aconitine in large amounts quicken the normal heart, even when the vagi are paralyzed and it is profused artificially outside the body. After apocodeine adrenalin no longer accelerates, but caffeine and aconitine can still quicken. The latter two drugs, therefore, affect the heart muscle. The antagonism between apocodeine and either adrenalin or pilocarpine is on tissues, and is probably not the same as that between atropine and pilocarpine. On the intact animal apocodeine produces erection of the hairs over the face area and back, and edema of the face. The former effect is due to peripheral sympathetic excitation, the cause of the latter is doubtful.

Treatment of Chronic Interstitial Nephritis.—The effect of various measures upon chronic interstitial nephritis by quantitative control of albumin and estimation of blood-pressure, has been studied by P. EDEL (Münch. med. Woch., Oct. 27, 1903), who comes to the following conclusions: Warmth and carbonated baths diminish both albumin and blood-pressure. The same is also true for rest in bed and inhalations of amyl nitrite. Exercise, especially climbing mountains, seems to have a very favorable influence; in normal individuals the pressure rises greatly, but in those afflicted with Bright's disease there is considerable dilatation of the vessels. The best results were obtained if the patients were allowed to exercise in the forenoon. Since albuminuria and increased arterial tension go hand in hand, it is likely that interstitial nephritis is directly due to a narrowing of the afferent vessels of the kidney. Neurasthenia constitutes an important etiological factor, and it would be a great mistake to condemn patients to muscular inactivity simply because they have a little serum albumin in their urine.

Treatment of Pulmonary Tuberculosis by Formaldehyde.—There are three different ways of administering formaldehyde in pulmonary tuberculosis. The

first is by inhalation, the second by intravenous injection, the third by electricity. Dr. CHOWRY MUTHU (Brit. Med. Jour., Oct. 24, 1903), in discussing the first method, says that the idea that volatile substances inhaled are beneficial in consumption is as old as the Greeks. There are two ways of using inhalation, first by the ora-nasal inhaler, second by the vaporizer. The inhaler is pyramidal, flexible and light, made of perforated zinc and fits the chin accurately. He recommends a mixture of 40 per cent. of formalin, one part of chloroform, two parts rectified spirit, a few drops of ammonia are added to the mixture to neutralize the pungency of the vapor. The advantages of this method are, first, its simplicity, and the fact that the patient is able to use it in the open air or indoors at will, and second, that it prevents the inhalation of dust, and third, that the patient after leaving the sanatorium is able to effect this method of medication himself. The vaporizer consists of a spirit lamp with open boiler, into the mouth of which is let a tray which carries paraform powder with a little menthol for neutralization. The moist products from the decomposition of the spirit causes the evolution of the gas. The steam renders the action of the formaldehyde more effective and penetrating. This vapor bath is taken for an hour or two daily with the doors and windows partly closed. The advantages of this instrument are that the patient's room and its contents are rendered aseptic by constant disinfection, so that without practical doubt all expectorated tubercle bacilli are killed daily. Two conditions are necessary for inhalation to be efficacious. First, the inhaler must cover the nose; second, it must be continuously worn. To the statements made by many that these methods of treatment are futile, it is interesting to note that the state of the lungs of those engaged in dusty occupations has always shown that the inhaled dust penetrates far into the pulmonary tissue. Furthermore, if a volatile substance like chloroform can, when inhaled enters into the circulation, it does not seem reasonable to doubt that formaldehyde when inhaled, especially with chloroform and spirit, does not enter the alveoli. The writer has kept full records of more than 100 patients, and his conclusions are that these methods are a distinctly advantageous accessory to the open air treatment. The intravenous injection method is as yet *sub judice*. The writer commences the treatment with 50 c.c. of a strength of 1 in 2,000, increasing to 1 in 1,000. The patient often complains of numbness in the hands. The temperature sometimes rises slightly and sick headache and shivering fits are occasional. Dr. Rankin has injected 200 c.c. of 1 in 500. There was no result from this save a numbness at the tip of tongue. The objection to this form of treatment is that owing to the non-vascular character of the tubercular tissue, the formaldehyde cannot reach the affected part. It is, however, not intended to kill the tubercles *in situ*, the treatment being directed more to the lessening of the general septic infection than to a direct attack upon the tuberculous bacilli. As to the electric method, it is not as yet proven to be of service.

Vioform.—Vioform is preferable to iodoform, since it is a stronger antiseptic and deodorant without possessing the disagreeable odor of the latter. Large quantities may be introduced into the system without giving rise to toxic symptoms, and sterilization up to 140° C. does not alter its properties. It is inferior to iodoform in only one respect, in that it is unsuited for the conservative treatment of tuberculous joints. R. WEHRLE (Correspbl. f. Schweiz. Aerzte, Oct. 15, 1903, supplement) does not hesitate to state that it is a most valuable antiseptic.

THE MEDICAL NEWS.

A WEEKLY JOURNAL

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SATURDAY, DECEMBER 26, 1903.

ERADICATION OF EXPECTORATION.

In a pamphlet recently issued by the Chicago Board of Health on Suggestions for the Teaching of Cleanliness among School Children the first direction to the teacher is that children should be taught very emphatically not to spit—it is rarely necessary. To spit on a slate, floor or sidewalk is an abomination. It must appeal to everyone that this is making a beginning at the proper place. Expectorations in healthy children is a habit indulged in mainly because of bad example, and as the child is an imitative animal, perpetuated. As the Health Department's bulletin says "To too many children their one ideal is the hoodlum or street Arab who can squirt through his teeth."

Now that the crusade against tuberculosis is well under way a better idea of the dangers of expectoration is gradually becoming manifest. Last year, at the meeting of the British Medical Association, it was shown by a series of carefully prepared statistics that while factory workers were very liable to contract tuberculosis when there were many men employees among the number and some of them had tuberculosis, where the employees were exclusively female, there was much less danger. The reason is not far to seek and is evidently the habits of the two sexes in

the matter of expectoration. Male employees are constantly subjecting their fellow-workmen to the danger of contracting disease by their habit of spitting around in all sorts of out of the way places where the expectoration becomes dried and gets into the air to become a source of infection for others.

That the immunity of working women in factories, where only women are employed, is not entirely due to their better habits as individuals—their avoidance for instance of alcohol and of exposure—can be understood from a second set of statistics which show that certain classes of working women, especially those who are employed in laundries and those who do duty as scrub-women in large public buildings, are particularly liable to suffer from tuberculosis. In these cases the source of the infection is entirely attributable to the fact that these women are brought in contact with expectorated material on garments that have to be washed, or on the floors in the ordinary course of their employment.

Special effort should be made at school and also at the home to teach boys that they have no more right to expectorate than have their sisters. The lesson is simple. Very little insistence would secure its effective learning. This of itself, small as it may appear to be, would do more at the present moment than any other simple precaution that can be thought of to help in the prevention of the spread of tuberculosis. We as physicians should use all the weight of our influence to secure this advance in manners and the result will be evident before the rising generation is many years older.

LEGISLATION AND FIREWORKS.

At a recent meeting of the New York State Medical Association a resolution presented by the Mississippi Valley Medical Association asking the cooperation of the medical profession in New York for the purpose of obtaining such legislation as will be necessary to prevent, as far as possible, the present list of casualties that occur every year on and about the Fourth of July in this country was unanimously adopted.

This movement has been taken up by many of the important medical bodies of this country within the last few months and promises to have a successful issue if medical men generally will interest themselves in presenting the subject properly to their legislators. Many State legislatures have just begun their annual sessions, therefore this is the appropriate time for physicians to bring their influence to bear and to furnish the

information necessary to make it clear how indispensable is legislation for the regulation of the present thoughtless but supremely harmful method of celebrating Independence Day.

The committee on Public Health of the New York State Medical Association are helping to distribute a pamphlet reprint from the *Journal of the American Medical Association* in which all the data necessary for a proper understanding of the awful mortality now usual at the beginning of July may be obtained. The last Fourth-of-July celebration caused the death or injury of nearly 4,500 persons. Among these 60 were killed outright, 10 lost the sight of both eyes, 75 lost one eye, 54 lost hands, arms, or legs, 174 lost one or more fingers and 3,670 received other injuries. Besides this fearful total there were over 400 deaths from tetanus which developed in wounds inflicted by fireworks on or around the Fourth of July. Many battles that are considered of great importance in history were fought without having a casualty list as large as this. No engagement of our Spanish-American War cost anything like so many lives or the disablement of so many of the combatants and the whole mortality and morbidity record of that war scarce equals in losses a single Fourth of July in deadliness.

There may be some doubt as to whether this is not an off year and whether, perhaps, there were not many more persons killed and injured than is usual. As a matter of fact, this is the first time in the history of this country that a complete list of the casualties incident to the Fourth of July has been made. Great care was exercised in the collection of the statistics and in the pamphlet issued by the *Journal of the American Medical Association*, the names of all persons who died from tetanus, with their residence, the circumstances of their wounding the special piece of fireworks that caused it and the termination of the case are reported.

No cases were accepted on mere hearsay and there was no accumulation of general statements from newspapers. In one large city where a newspaper reported 90 deaths only 10 were accepted in the statistics. The newspapers of Philadelphia stated that 500 people were injured in that city in connection with the Fourth-of-July celebration and that 380 received hospital treatment. The maker of the table could find definite details as to only 151 cases and these were the only ones reported. It is evident then that this table of mortality is eminently conservative in its make-up and that the injuries and fatalities

must be accepted without any demurrer because of supposed lack of faithful investigation. Surely, with these facts before them, legislators will realize the necessity for passing stringent laws with regard to the sale and use of fire arms and all dangerous classes of fireworks for the Fourth of July.

Three classes of deadly weapons, as the events prove, are now in common use among the young people of this country, for the making of the noise necessary to show their patriotism. These are the toy pistol—the most deadly of weapons—the blank cartridge, and the giant firecracker. A determined effort must be made to do away with the permission now granted very commonly to sell such fireworks and borough and city ordinances will have to be amended so as to prevent their use. If this can be accomplished during the present winter there will be over 500 fewer deaths at the beginning of July and 5,000 families will not be called upon to suffer anxiety and discomfort because of the wounding of one of the members of the family during the senseless celebration of the "Fourth," when for one day the peace and health of the country are practically committed into the hands of children between four and sixteen years of age, while the rest look on and breathe a fervent prayer that nothing may happen, though they are sure that something is bound to happen to a great many of the participants.

In many places all that will be necessary will be for local boards of health to exercise the powers of guardianship of public health to secure the enforcement of legal regulations already existent but allowed to fall into innocuous desuetude. In others, new laws will be needed but their passage can surely be secured without difficulty if the present awful state of affairs is properly presented to the public and legislators.

OCHRONOSIS.

THE term ochronosis was first applied by Virchow to a remarkable pathologico-anatomical condition in which at autopsy nearly all cartilages of the body presented an intensely black discoloration.

Following his publication in 1866 five additional cases have been reported, viz., by Bostrom, v. Hansemann, Heile, Hecker and Wolf, and Albrecht and Zdareck. In all of these "melanuria" was observed during life and in four the urine was black when passed. As regards the nature

of the urinary pigment Virchow suggested that this might possibly be a hematin derivative, while Boström, Heile and Hecker-Wolf regarded it as a melanin. Albrecht and Zdareck, on the other hand, although they were unable to isolate either homogentisinic acid or uroleucinic acid from the small amount of urine which was obtained at autopsy, express the opinion nevertheless that the melanuria may be referable to an alkapton acid or a corresponding derivative and suggest that the black color of the cartilage may then result through some interaction between an acid of this character and the common chondroitin sulphuric acid of the cartilage. In other words, they regard the ochronosis as the pathologico-anatomical expression of alkaptonuria.

Langstein recently has criticised the conclusions of Albrecht and Zdareck and has pointed out that the results of their chemical examination do not warrant the assumption that an alkapton acid was present in the urine. He communicates his own observations with reference to the urine of v. Hansemann's case, some of which had been preserved in a sealed glass tube. The urine reduced neither Fehling's solution, nor ammoniacal silver solution, and with ether no substance could be extracted which gave the alkapton reaction with a dilute solution of ferric chloride, viz., a momentary green coloration. All these reactions, however, were positive in the urine obtained by Albrecht and Zdareck. Like these observers, Langstein was unable to isolate either homogentisinic acid or uroleucinic acid, although these can readily be obtained with true alkapton urines, even when present in small amounts. As a further support to his conclusion that the melanuria in these cases is not referable to an alkaptonuria, he points out that in a true alkaptonuric, whom he was able to observe during many weeks, there was not noticeable the slightest discoloration of the cartilages of the ears.

In view of these contradictory reports, in which the diagnosis of ochronosis was only made at autopsy and in which altogether satisfactory examinations of the urine were not possible—in the one case only 20 c.c. obtained at autopsy were available, and in the other the urine had been preserved for several years in a sealed tube—it is interesting to note that in three undoubted alkaptonuric individuals observed in the United States the diagnosis of associated ochronosis could be made during life. A detailed report on this association may be anticipated at an early date.

ECHOES AND NEWS.

NEW YORK.

Illustrated Review of Physiologic Therapeutics.—This is the title of a most ambitious periodical published by E. R. Pelton, of New York. The first number, which is a quarto of 136 pages, is beautifully gotten up and the enterprise is worthy of the most active support. Dr. S. D. Morrell is the editor.

Christian A. Herter Lectureship.—The Faculty of the University and Bellevue Hospital Medical College announce the first series of Christian A. Herter Lectures, to be delivered by W. D. Halliburton, M.D., F.R.S., Professor of Physiology, Kings College, London, on "The Biochemistry of Nerve and Muscle." These lectures will be an extension of a course delivered before the students of the University of London; they will be illustrated by experiments and will contain the results of the lecturer's own physiological and pathological research. The course will begin on Monday, January 4, and will continue until Saturday, January 16, daily, at 4 o'clock, at the Carnegie Laboratory, 338 East Twenty-sixth Street. Those desiring reserved seats for the course will please communicate with Dr. E. K. Dunham or Dr. Graham Lusk.

Preventive Medicine Prize Essays.—The Maltine Company announces that after December 15 they will have ready for distribution the two essays on Preventive Medicine to which they awarded prizes of \$1,000 and \$500, respectively. They will be bound in permanent book form and will be sent by the company without charge to all physicians who request them. Address, The Maltine Company, Brooklyn, New York.

The Late Drs. Davison H. Smith, J. F. Chauveau, and David Franklin.—At a meeting of the Medical Association of the Greater City of New York, held December 14, 1903, the following report was received and adopted: It is with profound regret that your committee record the sudden and untimely death of Dr. Davison Heermance Smith, a member of this Association and the son of its esteemed President. The subject of this sketch was born in New York in June, 1875. After a suitable preparatory course of study he entered the academic department of Columbia University, receiving in due course the degree of B.A. From the medical department of the same university he was graduated in 1902, and soon afterward he was admitted to the House Staff of the New York Post-Graduate Hospital. It was in this institution that his death occurred from surgical shock, the result of a painful operation, bravely met, that was undertaken for the relief of mastoiditis. Possessing a genial and generous disposition, he endeared himself to a large circle of friends, and, though only on the threshold of his professional career, he gave promise of early success in a manifest zeal, earnestness of purpose, and faithful regard for duty. On behalf of this Association the Committee extends to the bereaved family of the deceased assurances of the inexpressible depth of its sorrow and sympathy in their affliction, and furthermore recommend that appropriate notice of his death be entered in the minutes of the Association and that a copy be transmitted to his family. (Signed) J. Blake White, P. Brynberg Porter, Wm. Seaman Bainbridge.

At the same meeting a report of the Committee on the death of Dr. Jean F. Chauveau was presented, which was in part as follows: A few months ago he celebrated the fiftieth anniversary of his entrance

to the medical profession, an occasion which prompted the affectionate congratulations of a large number of friends who had learned to value the kindness and gentleness, as well as the wisdom, with which he always met the requirements of friendship and professional loyalty. (Signed) A. B. Judson, A. B. Ball, F. E. Sondern.

Also a report of the Committee on the death of Dr. David Franklin, the concluding portion of which was as follows: Of him it may truly be said, medicine was his religion and his politics, his happiness and his misery. He was of unimpeachable honor and integrity. He had the gentleness of a woman and the nerve of a man of steel. He was keenly observant and of wonderful patience and endurance. He was beloved by his friends and adored by his patients.

Resolved, That this Association express by a record on its minutes its deep sense of loss in the death of Dr. Franklin, and that a copy of these resolutions be sent to his family, together with an expression of the Association's profound sympathy. (Signed) Samuel M. Brickner, Edward Fridenberg.

Opium at Auburn Prison.—It is said that through the connivance of certain officers at Auburn prison the convicts there are being daily supplied with opium. The opium evil is one of the worst with which prison officials have to contend. The officers are constantly in fear of the possible act of some opium-crazed convict, who frequently attempts murder for some real or imaginary wrong. As a result of Warden Mead's investigations, one officer has resigned and other resignations or dismissals are expected. Locked up in the warden's office at the prison is a bag of innocent-appearing English walnuts. They came about Thanksgiving time addressed to a convict. An officer with a keen scent thought he detected the smell of opium, and cracking one of the nuts found enough inside to satisfy the craving of an opium fiend for some time. Opium has been found frequently rolled up in tinfoil in bottles of mustard pickles. The officers have constantly to be on the lookout for this sort of thing. The physicians are under instructions to keep a close watch to see if any of the men are using it.

Eastern Medical Society of New York.—This society has engaged permanent quarters at Clinton Hall, 151-153 Clinton Street, New York. Possession will be taken on or about January 1. The building will offer every facility of the modern clubhouse, all of which will be open to the members. A reference library is one of the projected features of the society. At the annual election, held recently, the following officers were elected: President, Dr. Louis J. Ladinski; 1st vice-president, Dr. David Robinson; 2d vice-president, Dr. Tobias Berger; treasurer, Dr. Joseph Barsky; corresponding secretary, Dr. Abr. L. Wolbarst; recording secretary, Dr. A. J. Ronginsky. Dr. W. Freudenthal was elected trustee for three years. The chairmen of the new committees are: Committee on Ethics, Dr. A. A. Himowich; Committee on House, Dr. E. K. Browd; Committee on Admission, Dr. John A. Price; Committee on Library, Dr. Charles Rayevsky.

PHILADELPHIA.

Physician Seriously Injured.—Dr. George I. McLeod, Jr., of Ardmore, was badly injured on the evening of December 16 while trying to board a moving train at that place. Both feet were so severely crushed that they had to be amputated later at the Pennsylvania Hospital, where the patient was taken. He is now doing well and recovery seems

assured. Dr. McLeod served in Porto Rico during the Spanish-American war and last year distinguished himself at Ardmore by abandoning his practice to care for smallpox patients at that place.

Scientists to Meet in Philadelphia.—On December 29, 30 and 31, the annual meeting of five affiliated American scientific societies will be held at the University of Pennsylvania. The Association of American Anatomists will meet in the Wistar Institute; the Society of American Bacteriologists in the Laboratory of Hygiene; the Society for Plant Morphology and Physiology in Biological Hall; the American Physiological Society on Tuesday in Medical Hall, and on Wednesday at Jefferson Medical College, and the American Society of Zoologists, Eastern Branch, in Biological Hall.

Advantages of the Marine Hospital Service.—"Advantages Offered by the Public Health and Marine Hospital Service of the United States to Recent Graduates in Medicine" was the title of an address given to the students of Jefferson Medical College December 16 by Surgeon-General Walter Wyman. The speaker was the guest for the evening of the H. A. Hare Medical Society of the college. Dr. Wyman said that the principal features of the Marine Hospital service were not generally understood. After mentioning many of the facts regarding its organization he stated that there were 22 national marine hospitals and 121 relief stations. In them are treated annually 56,000 seamen. Continuing, Dr. Wyman said: "I know of no medical service in the world that holds out the same facilities for the professional advancement of its officers. It has at least fifteen expert bacteriologists. It offers opportunities and encouragement for continued study, free from the petty annoyances and interruptions of private practice. It keeps its officers supplied with the latest books, instruments and apparatus, beyond the reach of many recent graduates. Aptitude and ambition to excel in any branch of medicine, surgery or preventive medicine have in it their full chance of fruition. The service has a fine record and a brilliant future—and it is free from politics."

CHICAGO.

Report of Illinois State Board of Health.—The Secretary of the Illinois State Board of Health, Dr. James A. Egan, Springfield, has just issued a report on medical education and an official register of legally qualified physicians. The book contains a list of the city, district, and county medical societies; a list of the Chicago Medical Colleges, and their faculties; a summary of the laws and regulations governing the practice of medicine in the United States and territories of the Union; a list of the medical colleges in the United States, and a summary of the decisions of Illinois courts of interest to physicians. It is a book of nearly 600 pages; it is well printed, and reflects great credit on the Secretary of the Board, upon whom devolved most of the work in its preparation.

How Crime May Be Prevented.—This subject was discussed by Judge Richard S. Tuthill at the monthly dinner of the Marquette Club recently. Among other things, the Judge said: "There has been no improvement in 500 years in treating criminals. There is some modification in punishment, but the main idea is to punish the criminal. Punishment is not the only remedy. Adults should be punished, but the way to prevent crime is to teach the children that the police, the judge and the law are not their enemies. Criminality is a disease. If it has developed in the boy beyond cure, send him to an

isolation hospital for from one to three years, where he will have good men and good women to help him with their advice. The child criminal," continued the judge, "began with staying away from school. Then the boy who had to have amusement would patronize cheap theaters, and to go there had to steal. Then came the criminal court, the jail, and the bridewell, where he was graduated in crime through the agency of the State."

Reappointment of Dr. Reynolds.—Commissioner of Health Arthur R. Reynolds was reappointed by Mayor Harrison on Dec. 14, and his appointment confirmed subsequently by the City Council.

Reduction in Diphtheria Mortality from Antitoxin.—The health department states that since the introduction of antitoxin in the treatment and prevention of diphtheria, its mortality rate has been reduced by nearly one-half—that is, from an annual average of 6.25 deaths in every ten thousand of the population in the seven years, 1889-1895, to an annual average of 3.24 in the seven years, 1896-1902, of antitoxin treatment. But this is not enough. The seven years' experience clearly proves that no child should or ever did die of diphtheria when treated early enough with a sufficient quantity of good antitoxin. The pre-antitoxin mortality of diphtheria in Chicago was about 35 deaths in every one hundred cases of the disease. In the many thousands of cases among the poor and destitute treated by the department inspectors under the most adverse conditions, the rate for the whole number has been less than seven deaths in the one hundred cases. There are many physicians in Chicago and elsewhere who have records of hundreds of cases with a rate of less than two deaths per one hundred.

GENERAL.

Resignation of Dr. Goelet.—Dr. Augustin H. Goelet has resigned the Chair of Gynecological Electro-therapeutics in the International Correspondence Schools of Scranton, Pa., to take effect Jan. 1, 1904.

Vaccination for Railway Men.—The Pennsylvania Railroad Company on December 16 issued orders compelling all employes to be vaccinated. Dr. W. K. Shaw, local medical examiner, who has charge of the work in the Pittsburgh Division, began at the Union Station. All trainmen were vaccinated, and with a corps of assistants the vaccination of the men at the Pitcairn shops was begun. All the local shops will be visited and no employe will be overlooked.

Index Medicus.—This valuable publication has now some 450 subscribers—a meager list and unfortunately a commentary on bibliographical scholarship. We learn that there is every reason to believe that, if 500 bona fide subscribers can be secured, that the Carnegie Institute will continue its appropriation and make the *Index* a permanent affair. American physicians should not rest under the imputation that there are only 500 of its 120,000 practitioners who are up and alive to the interests that the *Index Medicus* represents. There should be thousands of active, wide-awake men in this country ready to support the *Index*. American physicians are proud of their institutions. Surely the extent of this is not measured by a paltry \$5.

Cause of Butler Epidemic.—Dr. George A. Soper, a sanitary expert, engaged by *The Engineering News* to investigate the typhoid epidemic at Butler, Pa., and its causes, reports that the epidemic has by no means attained its culmination, about 50 per cent. of the cases not having reached the critical stage. The epidemic he attributes to the suspension of the

mechanical filtration of the city water supply. In three weeks there were 1,000 cases, and up to December 14, 1,247 cases and 51 deaths had been reported. Announcement was made December 15 that Andrew Carnegie had donated \$5,000 to the Pittsburgh typhoid fever aid fund.

Southern Medicine.—Dr. W. E. Fitch, the founder, and for many years editor and business manager of *The Georgia Journal of Medicine and Surgery*, published in Savannah, Ga., has sold his interest in the publication to his former associate and co-editor, Dr. St. J. B. Graham, who now becomes editor and sole proprietor. The name of his new venture is *Southern Medicine*.

A Museum of Security.—The American Institute of Social Service has been holding recently a series of meetings at the United Charities Building, 105 East Twenty-second Street, relative to the establishment in New York of a museum of security. The plan proposed is modeled after that of the Association of Industrialists of France. Such an institution would contain not only models of devices to prevent accidents, but also exhibits of means to improve hygienic conditions. As a result of its establishment on the Continent statistics show, or seem to show, that in Germany during a given period the fatalities numbered proportionately only one-fifth of those in America, while in Austria the proportion was even smaller. In support of argument favoring a closer study of accident prevention, Rev. Dr. Josiah Strong, the well-known sociologist, speaks as follows: "During the last five years there have been 38,890 killed on the railways of the United States. The injured in the same time have numbered 253,823. So the daily average of killed has been 21 and of injured 139. From these statistics it is seen that there are in this country to-day 51,882 persons who are condemned to death, to be executed on the railroads, within the next five years, taking into consideration the increase in travel. And you must remember that thousands of others are being killed in mines, factories, and building operations. John Mitchell tells us that two men die of injuries in the Pennsylvania anthracite mines every day."

While the facts here cited would seem to be conclusive proof of a woful lack of safety appliances, it appears to us that conclusions drawn from them are inadequate as a basis for the establishment of a security arsenal in this city. The death rate might be decreased somewhat, but it is not taken into account that a majority of accidents to life and limb are the direct result of gross carelessness on the part of their victims; and, in spite of all that might be done in the direction proposed, such decrease would not be commensurate with the efforts either of inventors or philanthropists. Humankind has never been quite able to see why, if conditions were thus and so, it might not be made to live forever, and consequently the imaginary draught from "fountains of youth" is always very refreshing and is always just on the point of merging into a real and actual potion. It is a curious fact that the death rate the world over holds about the same ratio to the birth rate year after year in spite of artificial devices on the part of man and of devastating disease on the part of nature. Let us safeguard ourselves in every reasonable way, let us fight abnormal influences in our lives whenever possible, but when comes the inevitable hour let our passing be quiet and without fear.

End of One Anti-drug Movement.—The so-called anti-drug movement in which some of the best-known New York clergymen were interested has

come to an end through its connection with a quack medical concern. Annoyed at the manner in which it has been advertised in newspaper stories, the International Committee organized for the suppression of drug addiction, has dissolved, with a declaration that not one member had profited to the extent of a single cent through his connection with the work. It was also stated in the preamble of the resolution that contributions, despite many public appeals, have not been sufficient to carry on the benevolent part of the work on an extended scale. "Confusion has arisen in the public mind from the mingling of a charity with a purely business enterprise, and there is difficulty in separating the two, and this committee stands sponsor for its business as well as its benevolence in sight of the world" are the closing words of the preamble.

Obituary.—Dr. Francis W. Higgins died suddenly at Cortland, N. Y., December 18, of heart disease, aged forty-six years. He was President of the Third District Branch of the New York State Medical Association and Vice-President of the State Medical Association.

CORRESPONDENCE.

"DISAPPOINTING THE DOCTORS."

To the Editor of the MEDICAL NEWS:

DEAR SIR: The editorial article in your issue of today very justly takes the Charity Organization Society to task for the ill-considered title which it has used for one of its Short Stories. While we shall try to make amends, as you suggest, in the editorial columns of *Charities* we should like, also, to trespass upon your space so far as to give the title its deeper meaning.

The cure of tuberculosis has for so long been thought of by charity workers as an almost hopeless task that we felt a genuine joy when our Society saw itself becoming an adjunct to the successful physician in the treatment of the dread disease. And when, as in this instance, our agent not only furnished good food and medicine, but also good cheer, spurred the patient's ambition and nurtured her hope of recovery, a hope which a number of physicians did not share, we may, perhaps, be forgiven for becoming unduly jubilant.

We are well aware that doctors are not disappointed by the restoration of the sick to sound health, and to give a true history of the successful cure of a consumptive patient in which physician, nurse and charitable worker all participated as an instance of how we are disappointing doctors, was, of course, distinctly unfair. It should, perhaps, have been entitled "The Story of How we are Disappointing the Grave." It is undoubtedly understood by everybody concerned, that the title was not intended to be taken literally but was formulated for the innocent purpose of catching the eye of a reader. It is of a class with the remarks not infrequently heard, implying that lawyers are disappointed when equity and justice prevail without expensive law suits; that doctors are in clover in times of epidemic or that representatives of organized charity prefer seasons of industrial depression and hard times. All are alike unjust and alike in questionable taste.

Will the doctors please accept our sincere apologies?

Sincerely yours,

New York, Dec. 21, 1903.

EDWARD T. DEVINE.

Severe Grip.—The grip is particularly severe in New York City this winter, and pneumonia is a frequent and severe complication.

SOCIETY PROCEEDINGS.

SOCIETY OF THE ALUMNI OF CITY (CHARITY) HOSPITAL.

One Hundred and Eighth Stated Meeting, October 14, 1903.

The President, D. E. Walker, M.D., in the Chair.

Periodical Rise of Temperature After Miscarriage.

—Dr. Potter said he saw three weeks ago, at what would have been the fifth menstrual period, a young woman in her first pregnancy had an attempted miscarriage. She first noticed, after getting up in the morning, that her night clothes were blood-stained, and she had pain. He was informed over the telephone of this condition by the husband. He adopted the usual treatment, and the pains stopped. The cervix at no time was very much dilated, and there was no further appearance of the hemorrhage. He made one vaginal examination, using rubber gloves, which had been boiled in a solution of lysol. Two days later the temperature went up to 104° F. A small dose of calomel and tincture of aconite was given and the temperature fell to 99° F. Three days after that there was another rise of temperature. The lungs were normal. In examining the patient this time he noticed a small boss in the first lumbar vertebra, but there was no history of any pain in the back nor difficulty in stooping over; nothing referable to Pott's disease when a child, and there was no pain around the eminence in the lumbar region. There was a slight pain in the lower iliac region of the left side, which was relieved by turning on the right side. That was relieved and temperature became normal. Several days later the patient being practically well, and walking around the room, the temperature again rose to 103.8° F., with no local symptoms. The blood had been examined five or six times for malarial plasmodia, but none had been found. Three physicians have seen the case, and none of them has made a diagnosis. The first physician who saw the patient in consultation never suggested the possibility of a general infectious disease. He thought it was due to the miscarriage—that is, pus somewhere in the pelvis. The surgeon who saw the case five or six hours afterward, at the request of the family, threw out any possibility of trouble in the pelvis. He said he could find nothing there, and thought the case was typhoid fever. She had typhoid fever five years ago. It certainly was not a typhoid temperature, and there was no Widal reaction. The urine had no albumin, no casts, but a few pus cells; sp. grav. was 1.018; reaction acid. Leucocytes at time of second attack were 12,000.

Dr. M. Manges said with reference to second attacks the facts are clearly stated by Kussmaul. Of his 1,000 cases 2¼ per cent. had two attacks. The interesting feature about second attacks is this: That the susceptibility to a second attack is greatest within the first year, is less in the second, and diminishes up to the fifth year, but a second attack may occur at any time. He had a patient who had had three distinct attacks during her life. She is thirty-four years of age, and he thought the diagnosis in each attack was unimpeachable. At the Mount Sinai Hospital second attacks are met with, but the point is, in the first five years one is most susceptible to the reinfection.

Adherent Pericardium.—Dr. Morris Manges presented a case of exophthalmic goiter, which was first admitted to the Mount Sinai Hospital some seven years ago, and entered the Ophthalmic Division on account of the marked exophthalmos—that being so marked that a corneal ulcer had developed near the outer canthus of the eye, the evidence of which you see. A double

canthotomy had to be done at that time. One sees the evidence of the corneal ulcer and where the palpebral fissure has been lessened. Dr. Manges called attention to the unique pulsations in the epigastrium, the condition of the apex beat and some of the phenomena that accompany an adherent pericardium. He also has a moderate hypertrophy of both ventricles and a slight systolic murmur. There is no history pointing to an adherent pericardium, but that need not deter one from making the diagnosis, because it is not an infrequent occurrence to find an adherent pericardium, where there is no history of pericarditis. One should bear in mind that cases where pericarditis has existed may occur without subsequent evidence of pericardial adhesions. Dr. Manges remembered one case in particular, where a boy with a purulent pericarditis was operated on, and 75 ounces of pus was removed. That boy within four months afterward became a District Telegraph boy, and although this pericardium is absolutely shut off as a result, there is absolutely no clinical manifestation of the condition. In the epigastrium and in the region of the apex beat there is an interesting series of "pulsations," which are changed in association with the respiratory movements. At the end of inspiration the movements are much more marked, and at the end of expiration they are less marked, all of which changes are due to the movements of the diaphragm. Broadbent's sizes can also be demonstrated in the posterior scapular line of the ninth, tenth and eleventh spaces—with each systole there is a retraction. For this one needs a good side light, and it is to be explained in the same way as the retraction in the epigastrium is.

This patient has not the paradoxical pulse, the venous phenomena in the neck or the first rib sign. This epigastric sign is not usually described in text-books on this subject. The case in that respect is a unique one. Cases of adherent pericardium are much more common than are supposed. The X-ray examination was very useful in corroborating some of these facts.

Dr. D. H. Wiesner said that the eye symptoms mentioned, and the condition present, are interesting. It is also a very unusual case. It is very seldom that one gets an adhesion of the two lids—*anchyloblepharon*—as in this case, after a cantholysis. The fact of the cantholysis being necessary, of course, would indicate the extremeness of the case.

Renal Calculi; Nephrotomy and Nephrectomy.—

Dr. A. Lyle presented this case. Mrs. D., Italian, thirty years of age, entered the hospital June 29, 1903. Family history negative. Present history: Two months ago gave birth to a child, and since then has had severe pain in right lumbar region—pain being transmitted forward and downward to inguinal region. Had chills, fever and night sweats. On examination temperature was 105° F., pulse 130. Palpation revealed an oval hard mass in the kidney region, while the abdominal muscles on the same side were hard and tense. Patient complained of severe pain on pressure of the right abdominal muscles, as well as on the bimanual pressure. The patient was put to bed for observation. Urinary analysis showed sp. gr. 1.010, alkaline, moderate amount of albumin, pus, blood and renal epithelium. For three days temperature ranged between 101° and 104.5° F. Diagnosis of renal calculi with pus was made. On July 2 an aspirating needle was introduced into the right kidney under cocaine anesthesia, and pus evacuated. Ether was at once given, and a lumbar incision made over the kidney. Patient's condition was critical and extreme haste was made necessary. The bleeding points were controlled by gauze packing,* and the kidney was incised longitudinally

through the cortex into the pelvis. Several small abscess cavities were opened and four calculi removed. The anesthetic had to be discontinued before the pelvis of the kidney was reached and free stimulation resorted to. The wound was tightly packed with plain sterile gauze and the patient returned to bed. The temperature dropped that evening to 100.5° F., and the pulse to 120. The following morning the temperature was 99° F., and the pulse 112. She rallied remarkably well from the operation, but the temperature ran high, varying between 99° F. and 102° F., or at times 104° F. Nephrectomy was advised, but persistently refused, until patient was in almost a moribund condition. On August 6, with temperature 102.8° F., pulse 120, the patient was again put under ether, but before anesthesia was complete the heart fagged and the anesthetic was discontinued—a hurried dissection of the kidney with the finger was made until all adhesions were freed. The patient being in a moribund condition, no dissection of the vessels was made, but two large pedicle clamps were made to grasp the vessels and ureter. The kidney was removed, the wound packed with gauze and the patient returned to bed, the whole procedure being completed in five minutes. Saline infusions and other free stimulation served to tide over the critical moments. The convalescence was uneventful, and the patient was discharged on August 30, 1903.

Dr. F. M. Jeffries reports on the specimen as follows: "Multiple abscesses, acute and chronic interstitial nephritis. Parenchymatous degeneration. Acute and chronic glomerular nephritis. Calcareous degeneration and numerous casts."

The Relation of Proteids to Edema in Mirantic Children, with Urinalysis in Infantile Diarrhea.—Dr. Potter A. Palmer, of East Orange, N. J., read this paper. Will be published in a subsequent issue of the *MEDICAL NEWS*.

Dr. W. L. Baner, in discussing Dr. Palmer's paper, said that one not infrequently finds infants with severe diarrhea, who have a considerable amount of edema, and the urine does not show anything, and one is in doubt about what to do. The edema certainly seems to come in some way from the inanition of the child, and it is therefore quite a problem just how to adjust the food, so as to increase nutrition without increasing the diarrhea. In Dr. Potter's cases the dropsy was invariably due to inanition—what might be called an inanition edema—but there are some cases in which there is an acute nephritis, secondary to the dysentery. He had in mind two cases, giving the agglutination test with the *Shiga bacillus* in which albumin, casts and blood were found in the urine. In one case the toxemia was very severe. The suppression of urine became complete in that case. The second case had a favorable termination, and the urine cleared up after the dysenteric symptoms disappeared. In regard to the question of edema being due to inanition, he remembers the case of a man who fasted forty-five days some years ago, and was much troubled toward the end of his fast with edema of the ankles and feet, so that he could hardly get on his shoes. His urine was normal. No blood examination was made in his case to see if there was hydremia, but there seemed to be some distinct connection between the inanition and the edema.

Dr. A. Lyle said, in reply to Dr. Reilly, that there was no examination made of the other kidney. He felt satisfied from the patient's general condition and the condition he found this kidney in when doing the nephrotomy, that there was no function being performed by this kidney, and the temperature that the patient ran afterward being so septic, it was decided to

remove it. With regard to the length of time the clamps were left on, he left them on for forty-eight hours. He had no idea how long they should be left on.

Dr. R. Guiteras congratulated Dr. Lyle on removing the kidney in five minutes on the second operation, because in a great many of these cases of calculous nephritis there is so much sclerosis of the kidney and so many adhesions that it is almost impossible to remove it in any time. The upper leaflets of the perirenal fascia in such cases are principally involved, and the adhesions to the diaphragm or to the vena cava may be so firm as to render the removal of the organ impossible. Very often when a nephrotomy is performed in a case of this kind and all the stones are not removed sometimes one cuts into an abscess cavity or the pelvis of the kidney and evacuates the pus, feels no stones, but afterward if the kidney is removed one will find a stone in some part of the kidney communicating with the abscess cavity. Another interesting feature in this case was the leaving on of the clamps. In two cases Dr. Guiteras has left them on after nephrectomy. The first time for four days. He presented that case before the Genito-Urinary Society. There were a number of general surgeons present, who discussed the case, and no one had had the experience before of leaving on clamps, and could not state just how long they should be left on. In the other case he left them on for four days, but in reading over the literature of the subject afterward he found that a French surgeon had left clamps on only forty-eight hours, while another one left them on but twenty-four hours, and there had been no hemorrhage following their removal.

Dr. J. R. Goffe said the case seems to speak for itself. Cases of a similar pathological condition are, of course, not uncommon, but the dexterity and rapidity with which the operation was performed is rather unique. During the last year at the Polyclinic he had a case of stone in the kidney that had been diagnosed as an ovarian tumor. There was a large tumor that reached from the site of the kidney into the pelvis and was fluctuating, but he was able to differentiate by careful examination between the pelvic organs and this tumor, and following it up, he made up his mind it was a kidney. After making a posterior lumbar incision he evacuated an immense quantity of pus from the kidney, and found a large stone in the pelvis of the kidney blocking the mouth of the ureter. The woman was not in such a precarious condition as the patient spoken of to-night. A nephrotomy was done at the time. After evacuating the pus (it was a multilocular affair), the kidney was dissected out and removed. The patient recovered. She had been treated for malaria for a year. She had had periodical attacks of chills and high temperature, and at an interval of some weeks, sometimes a month, she would have a comparatively normal temperature, and be up and about—then she would have a repetition of the attack. Finally she fell into the hands of another man who made a diagnosis of an ovarian cyst and sent her for operation.

Dr. E. M. Sill has examined the urine of quite a number of babies with edema, and was unable to find albumin in any urine examined, except in those with very high fever, and in those cases he thought it was due more to the fever than any kidney inflammation.

Dr. M. Manges said the name edema, given by Dr. Baner, is a very apt one, and has its foundation in a very interesting theory as to the causation of dropsies and edema. Dr. Baner calls attention to the enormous importance of general nutrition, and especially as involving the permeable endothelium of the smaller vessels, and in giving the various etiological factors in

the causation of edema and such conditions; he also lays especial stress upon the nutrition of the endothelial cells. It stands to reason that in these marasmic and underfed infants the endothelium will be much more permeable, and the name given by Dr. Baner of inanition edema might be accepted on that basis.

Dr. M. Manges presented a specimen of radium, a grain and a half in weight and described and demonstrated its action, although the case of cancer for which it had been purchased was not benefited by its use.

THE HARVARD MEDICAL SOCIETY OF NEW YORK CITY.

Regular Monthly Meeting, held Saturday, October 24, 1903.

The President, Frank W. Daniels, M.D., in the Chair.

Appendicitis in its Diagnostic and Surgical Features.—This was the title of the paper of the evening and was read by Dr. John B. Walker, who said that every surgeon occasionally is surprised to find in cases of appendicitis where he expected that the operation would be comparatively easy that dense adhesions or other complications are present, making the operative procedures extremely difficult. It is evident in these cases that previous attacks of appendicitis have been completely latent, or have given such few symptoms as not to have attracted the patient's attention seriously, or a least not to have led him to call in a physician. These are the so-called recovered cases of appendicitis, yet it is evident that the recovery is a step toward the deterioration of tissue rather than any true improvement. These exceptional cases only serve to emphasize the difficulty of diagnosis, and of determining whether operation is necessary or not. The best authorities, like McBurney and Richardson, do not insist on operation in every case of appendicitis.

Simple Appendiceal Colic.—This affection is the simplest form of appendicitis and has for its principal symptom colicky pains. Usually there is disturbance of the pulse, but commonly no, or at most very slight, disturbance of the temperature. There is no true fever and no tumor can be felt. A few hours after the onset the pain diminishes and the patient usually goes on to satisfactory recovery. These cases are due probably to mechanical kinking of the appendix and are not truly inflammatory in character. If several such attacks occur it is evident that the appendix has become a point of less resistance and infection may follow with serious results, hence it is better to operate and remove that organ.

Suppurative Type.—In the second form of appendicitis, characterized by the development of suppuration, besides the pain there is a rise of temperature to 101° or 102° F. and of pulse to 120. The abdomen becomes rigid and tenderness over the appendix becomes marked. In these cases it is difficult to decide whether to operate or not during the attack. If suppuration should become extensive there is likely to be rupture of the appendix, followed by peritonitis with perhaps fatal termination. An important sign of advancing danger, in Dr. Walker's experience, has been the occurrence of pain when the abdomen is touched even on the other side. This extreme tenderness usually indicates that the collection of pus in the appendix has become tense and is in danger of rupturing.

Gangrenous Appendicitis.—In the third and severest form of appendicitis the preliminary symptom is usually severe pain followed by nausea and chilly feelings, often to the extent of a full chill and rigor. Sometimes there is a delusive amelioration of symptoms when gangrene sets in, during which the attending physician may

complacently consider that the patient is getting better. Most of the cases with sudden severe symptoms require early and immediate operation. It is not always easy to decide what must be done. Leucocytosis has been assumed to be of assistance in the diagnosis and the presence of a white blood cell count of 15,000 to 18,000 is usually a grave indication. Fortunately the largest number of appendicitis cases are not of this severe form but are simply catarrhal inflammations and amelioration can be looked for. In such cases the interval operation is the best and most suitable, besides being the procedure most likely to commend itself to the patient and to his friends, till they grow accustomed to the idea of operation. In some cases all signs fail and notwithstanding the fact that the classical symptoms of appendicitis appear to be present, at operation some other pathological condition is discovered. In the female, of course, ovarian disease may readily simulate appendicitis and must be constantly borne in mind. Even in true appendicitis the symptoms may vary from the classical type. At times the point of tenderness is not at McBurney's point, midway between the umbilicus and the anterior superior spine, but may be quite distant from it. In one case Dr. Walker even found it behind in the loin. A high leucocytosis is of value in helping diagnosis, but a medium leucocytosis gives no information except that any sudden increase may point to a serious progress in the pathological condition.

Premature Operations not Regretted.—As a practical conclusion it must not be forgotten that many surgeons have regretted delay in operating, but that there is no lasting regret over premature operation. For this reason then, the surgeon must be called early into the case to share the responsibility and must be ready to give the patient the benefit of the doubt by operating if there seems to be any good reason therefor. More than in any other disease, in appendicitis delay is dangerous. Even where recovery takes place the condition for future operation is always rendered a little worse. The unreasoning opposition to immediate operation in these cases is now gradually disappearing as the result of the growing conviction that early surgery is sure to be life-saving in the end and has very few objections. Dr. Walker's paper will appear in a subsequent issue of the *MEDICAL NEWS*.

Appendicitis and Pyosalpinx.—Dr. Egbert Grandin said that pyosalpinx and appendicitis are symptomatically so closely related that mistakes are almost inevitable in many cases. In a recent case, he saw all the typical symptoms that are usually supposed to indicate appendicitis, the rigid rectus muscle, with knees drawn up, the pain in the right iliac region, with tenderness at McBurney's point and the general uneasiness so characteristic of intestinal trouble. As the temperature was low and only the pulse affected, the diagnosis of appendicitis seemed sure. The operation was done by an incision in the right iliac region and a normal appendix was found with right salpingitis and ovarian abscess. Six to eight ounces of pus were evacuated, yet the appendix lying in close contiguity with the abscess wall was absolutely normal.

Removal of Normal Appendix.—In cases such as those just described where the appendix is already in the operator's hands, Dr. Grandin prefers to remove the appendix, even though there are no pathological lesions in it. The removal of the appendix does not add to the danger of the operation while it is of distinct benefit to the patient in doing away with all risk of subsequent development of appendicitis. Even in cases where the operation is not on the right tube and ovary, but for some other gynecological conditions or intra-abdominal lesions quite distant from the appendix, he considers it

better to remove this useless organ, which may so readily prove a source of subsequent danger requiring operation. Dr. Grandin has seen several conditions simulating appendicitis and does not always expect, even in apparently classical cases to find a diseased appendix. In one case recently he found a hernia of the ileum, through an aperture in the mesentery. Two inches of the gut had been forced through and the ileum was covered with a black fibrinoplastic exudate. A resection of the gut had to be done and afterward a careful search was made for the appendix, which was found to be perfectly normal. In a case of presumed relapsing appendicitis, in which there had been apparently several characteristic attacks, there were some anomalous symptoms, and consequently a doubt as to the pathological condition that might be found. A median incision was therefore made and the omentum was found adherent to the base and front of the bladder. This was tied off and after considerable search the appendix was found to be perfectly normal and was removed, to avoid subsequent complications.

Reflex Neuroses.—There seem to be a certain number of cases of appendicitis in which there is very little true inflammation. It is questionable whether these are neurotic in origin or whether they are of the so-called catarrhal type, a term which Dr. Grandin does not like. The main symptom of these cases is a low grade inflammation, which gives rise to so-called intestinal indigestion. At intervals the patient feels discomfort in the right iliac region, there is a sense of distention with constipation, though relief is usually afforded by a laxative. This used to be considered due to trouble around the cecum. Adhesive inflammation with narrowing of the bowel and disturbance of peristaltic motion. Such cases sometimes have a long history. Dr. Grandin has recently seen one that has run for eleven years and now has no further attacks. These are the cases that deceive physicians into thinking that they may have time to wait, though at any moment a fatal complication may be developing.

Interval Operation.—Dr. Grandin considers that it is better to operate in the interval, but there should be no waiting until tumor formation, though there seems to be an impression abroad, among general practitioners of medicine, that this should be looked for. If the patient has had one frank attack of appendicitis, there should be no question of waiting for another to decide the diagnosis, since a second attack may prove fatal. Certainly the old custom of waiting for a series of attacks, even though these are slight, is fraught with great danger for the patient and will often be a source of worry and annoyance to the attending physician and risk to the patient.

Indications for Operation.—The surgeon should not consider that the temperature is an important danger signal in appendicitis. Even though the temperature is normal, if the pulse be high the patient should be operated upon. Any sudden change, especially in the patient's sense of discomfort, should be the signal for serious consideration as to the necessity for operation. In gangrenous cases it must not be forgotten that the patient may become quite comfortable, just at the moment when operation has become absolutely necessary if life is to be saved.

Elective Appendicectomy.—Dr. Grandin believes that whenever the abdomen is opened for any other condition, the appendix should be removed whether it shows signs of disease or not. This puts the patient at once beyond all the dangers likely to accrue to him from the possession of this useless organ. It takes but a few minutes to do the operation, it adds nothing at all to the risk to anyone who understands the circumstances;

certainly any physician or surgeon himself, would prefer to have his appendix removed under such conditions, instead of leaving it to the chance of fate and future danger.

Unwise Waiting.—Dr. William B. Coley said that many a physician has learned the un wisdom of waiting to have the operation for the removal of the appendix done on his patient in the interval. No set of symptoms can be depended on to give absolute information as to the time when operation should be done. In a recent case Dr. Coley operated upon a patient with a normal pulse and temperature. In this case there had been some gastric symptoms but no local pain or tenderness, and there was only a generalized colicky pain which increased in amount. The pulse was at 73, the temperature 98.5° F. Great rigidity and pain developed over the lower part of the abdomen and this was so marked that it was considered necessary to operate, although the operation was done within twenty-four hours after the development of the first symptom, the whole pelvis was found full of pus. In a case in Brooklyn not long ago the patient developed a temperature of 103° F., which gradually subsided in the course of the two subsequent days to normal. Suddenly collapse took place and death followed, and as no autopsy was allowed, the absolute condition present could not be determined.

Danger of Waiting.—It is good principle to wait, but it is fraught with danger. Dr. Coley visits a summering place every year and finds that country practitioners wait even more than their city brethren, and as a consequence there are some gaps in the circle of acquaintances every year with the story of death from appendicitis. It is not often that a surgeon regrets having operated too soon. Physicians and surgeons both often regret having waited too long.

Differential Leucocyte Count.—Dr. George Brewer said that there has been serious disappointment because of the failure of the leucocyte count to give any definite information with regard to the development of a septic process. At one time it was thought that this would be of significant value. Very recently he has found that the differential leucocyte count seems to give important information. It is possible to have a low leucocytosis, yet a septic process be in full swing. A differential count will show in these cases according to the experience at Roosevelt Hospital, that the polynuclear leucocytes are increased much more than their due proportion. Usually the polynuclears number about 62 per cent. of all the leucocytes. When over 70 per cent. of polynuclear leucocytes are present the surgeon may look for abundant pus formation. In several recent cases in which this was true very large abscesses were found.

Failure of Leucocytosis.—Dr. Fiske said that it is evident that in appendicitis as in pneumonia leucocytosis may fail to make its appearance in certain cases. In pneumonia experience shows that the absence of leucocytosis speaks for special virulence of the disease. The same thing would seem to be true with regard to appendicitis in certain cases. To look for leucocytosis then may be worse than useless. Dr. Fiske believes that time can be saved by operating early. If the patient comes down with appendicitis and is operated on at once, he will be able to be around in three weeks, or less as a rule. If after the attack is over, ten days or two weeks are consumed in waiting until the patient is supposed to be ready for operation, altogether at least six weeks will be required before the patient can be out of bed. Early operation has no regrets.

Dr. Howard Lilienthal said that it requires much more courage to advise waiting than to counsel operation. No surgeon or physician, no matter what his experience, can tell absolutely, so treacherous is appendicitis, what will happen in the next hour in a given case.

The case may be running an apparently normal course and yet the virulence of the infection may be such as to cause septic thrombosis of the mesenteric veins. If this happens then the removal of the appendix will not be followed by recovery but the patient will develop further septic conditions, liver abscess may occur and death will take place in two or three weeks. This constitutes an important argument for early operation and against not waiting.

Mount Sinai Experience.—Last year at Mt. Sinai 110 cases were operated upon for appendicitis. There were about 8 per cent. of deaths—all cases being included in the statistics, even those that were considered to be suffering from general peritonitis at the time the operation was performed and who were operated upon only to give them a possible chance for life. The older statistics gave between 20 to 25 per cent. of deaths in these same cases. Dr. Lilienthal gave some details of typical cases in which delay was made because of the influence of other consultants and in which, even when the issue was not fatal, the patient was not benefited by the delay. In a recent case the abdomen was extremely sensitive so that the patient could only be examined under an anesthetic and there were the signs of general peritonitis. Turbid fluid was found in the hypochondrium and in the pelvis. As little packing as possible was used in the case, so as to avoid injuring the peritoneum. Even the use of gauze pads in these cases almost surely does harm. A small cigarette drain was inserted down to the root of the appendix and though the case seemed hopeless the patient recovered. In such cases death was inevitable a few years ago and now many of the patients are saved. Dr. Lilienthal has found the blood count absolutely of no use and considers that when there is doubt the best thing to do is to operate.

True Appendicitis.—Dr. Lilienthal gave the details of certain peculiar symptoms occurring in his own daughter, aged nine years. She suffered from a peculiar stomachache of colicky nature, during which, however, there was no fever, no rise of pulse, no localization of symptoms and no tenderness of the abdomen. It recurred several times at long intervals and then began to recur at shorter intervals. It was causing so much discomfort that operation was decided upon, and as a sensitive point in the right iliac region could be found on deep palpation, the incision was made as for an ordinary appendicitis operation. Much to Dr. Lilienthal's surprise two fecal concretions were found in the appendix and with them some grape-seeds. The mother of the child had always insisted that it must not swallow grape-seeds. The Doctor himself, doubting that grape-seeds had ever caused any appendicitis, had rather winked at the idea of such a stern prohibition and now realizes better the good advice it was.

Appendicitis and Diagnosis of Peritonitis.—Dr. Frank Daniels said that appendicitis itself is not diagnosed until it causes an accompanying peritonitis. The true diagnosis of appendicitis cannot be made because, while that organ itself is alone affected, it does not give sufficiently pathognomonic symptoms. In a recent case under Dr. Daniel's care he had a somewhat similar experience to that of Dr. Lilienthal. The patient suffered from attacks of colicky pain, but without any definite localization and without any rise of temperature or increase in the frequency of the pulse. He has become convinced himself that such mild, obscure cases of appendicitis, are much more frequent than has been thought and constitute preliminary symptoms usually so little attended to by patients that they tell their physicians nothing of them when more serious conditions develop. It is sometimes the custom to speak of these as functional or neurotic, but they are probably organic.

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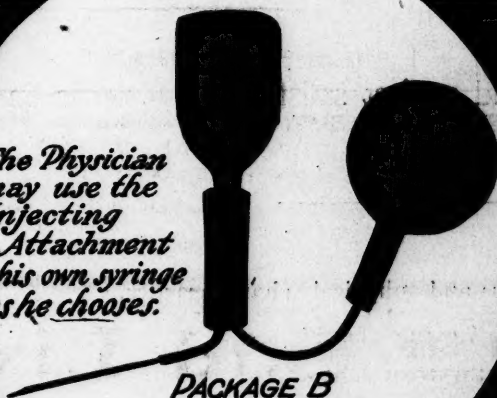
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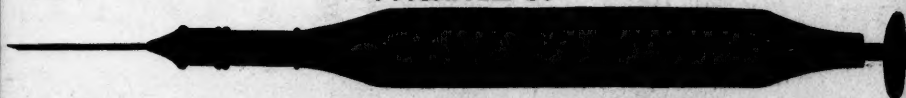
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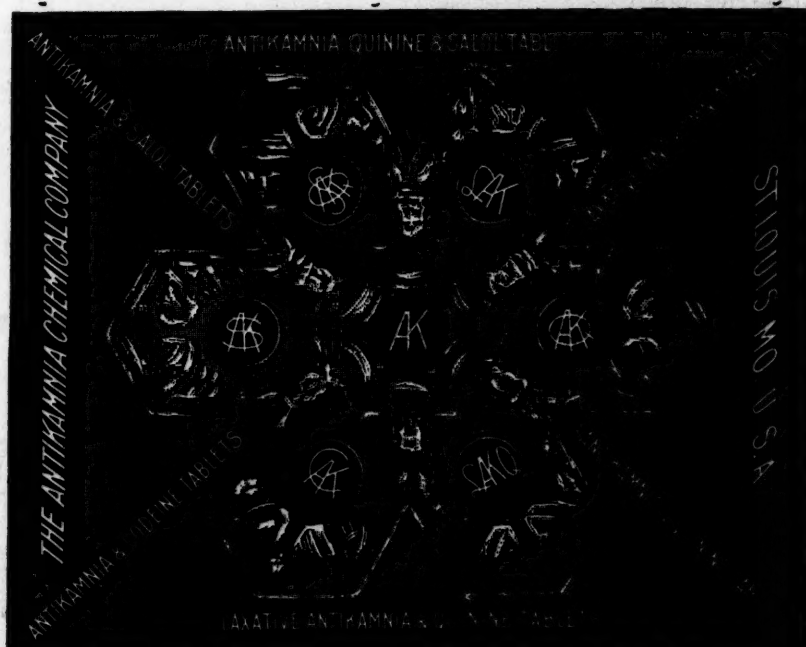
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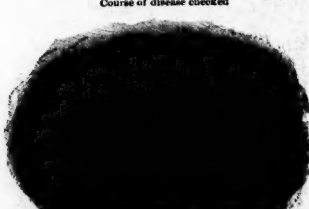
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Course of disease checked



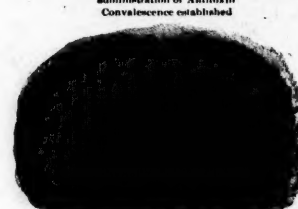
Twenty-four hours later



Twenty-four hours after
administration of Antitoxin
Convalescence established



Second day of disease
Showing involvement of
tonsils and hard and
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At this stage of disease
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Second day after admin-
istration of Antitoxin
Showing throat resuming
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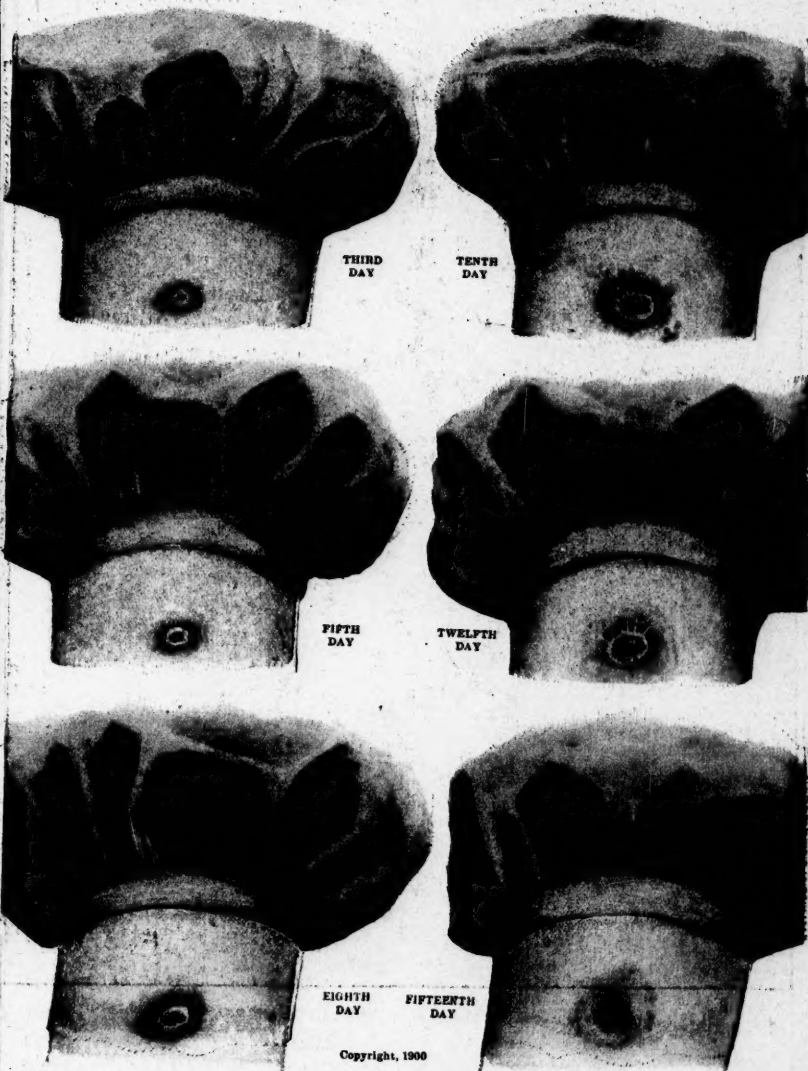
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American Asso. of Genito-Urinary Surgeons.....	(To be selected).....	St. Louis, Mo.....	J. Van der Poel, New York City.
Amer. Asso. of Obstetricians and Gynecologists.....	(To be selected).....	Philadelphia, Pa.....	W. W. Porter, Buffalo, N. Y.
American Climatological Association.....	June 2-4, 1904.....	Philadelphia, Pa.....	G. H. Hingdale, Philadelphia, Pa.
American Dermatological Association.....	June 2-4, 1904.....	Niagara Falls, N. Y.....	F. H. Montgomery, Chicago, Ill.
American Electro-Therapeutic Association.....	September 22, 1904.....	St. Louis, Mo.....	Clarence E. Skinner, New Haven, Conn.
American Gynecological Society.....	May 25-27, 1904.....	Boston, Mass.....	J. R. Goffe, New York City.
American Laryngological Association.....	May, 1904.....	Atlantic City, N. J.....	James E. Newcomb, New York City.
American Laryn., Rhin. and Otolological Society.....	May, 1904.....	Chicago, Ill.....	W. C. Phillips, New York City.
American Medical Association.....	June 7-10, 1904.....	Atlantic City, N. J.....	George H. Simmons, Chicago, Ill.
American Medical-Psychological Association.....	June, 1904.....	St. Louis, Mo.....	C. B. Burr, Flint, Mich.
American Neurological Association.....	June, 1904.....	St. Louis, Mo.....	Greene M. Hammond, New York City.
American Ophthalmological Society.....	July 3, 1904.....	Washington, D. C.....	S. B. St. John, Hartford, Conn.
American Orthopedic Association.....	June 7-9, 1904.....	Atlantic City, N. J.....	John Ridlon, Chicago, Ill.
American Otolological Society.....	July 2, 1904.....	Washington, D. C.....	F. L. Jack, Boston, Mass.
American Pediatric Society.....	May, 1904.....	Detroit, Mich.....	S. S. Adams, Washington, D. C.
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Association of American Anatomists.....	December, 1903.....	St. Louis, Mo.....	G. S. Huber, Ann Arbor, Mich.
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Association of Military Surgeons of U. S.....	May, 1904.....	St. Louis, Mo.....	Major J. E. Pilcher, Carlisle, Pa.
Canadian Medical Association.....	September, 1904.....	Vancouver, B. C.....	George Elliott, Toronto, Canada.
International Association of Railway Surgeons.....	June, 1904.....	Chicago, Ill.....	J. J. Mitchell, Chicago, Ill.
Medical Society of the Missouri Valley.....	March 24, 1904.....	Lincoln, Neb.....	Chas. Wood Fassett, St. Joseph, Mo.
Mississippi Valley Medical Association.....	Oct. 11-13, 1904.....	Cincinnati, O.....	H. E. Tuley, Louisville, Ky.
Seaboard Medical Association.....	December 15, 1903.....	Wilson, N. C.....	Geo. E. Bagby, Newport News, Va.
Southern Surgical and Gynecological Asso.....	December 15-17, 1903.....	Birmingham, Ala.....	W. D. Haggard, Jr., Nashville, Tenn.
Tri-State Medical Society of Ala., Ga. and Tenn.....	October, 1904.....	Chattanooga, Tenn.....	Frank T. Smith, Chattanooga, Tenn.
Tri-State Med. Soc. of Carolinas and Virginia.....	Feb. 24-25, 1904.....	Danville, Va.....	Rolfe Hughes, Laurens, S. C.
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Tri-State Med. Asso. of Md., W. Va. and W. Pa.....	May, 1904.....	St. Louis, Mo.....	Frederick W. Foetman, Cumberland, Md.
Northern Tri-State Medical Association.....	July.....	St. Louis, Mo.....	H. D. Wood, Angola, Ind.
Southwestern Tri-State Med. Asso. of Texas, Oklahoma and Indian Territory.....	Oct. 5-6, 1904.....	Da'las, Texas.....	S. E. Milliken, Dallas, Texas.
Academy of Ophthalm. and Otolaryngology.....	August 24-26, 1904.....	St. Louis, Mo.....	D. T. Vail, Cincinnati, O.
Western Surgical and Gynecological Asso.....	December 24-29, 1903.....	Denver, Colo.....	George H. Simmons, Chicago, Ill.

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Alabama, Medical Association of the State of.....	April 19, 1904.....	Mobile, Ala.....	G. P. Waller, Montgomery, Ala.
Arizona, Medical Association of.....	April, 1904.....	Phoenix, Ariz.....	Charles H. Jones, Tempe, Ariz.
Arkansas Medical Society.....	April 26-30, 1904.....	Texasarkana, Ark.....	J. P. Runyan, Little Rock, Ark.
California, Medical Society of the State of.....	April 19-21, 1904.....	Paso Robles, Cal.....	G. E. Evans, San Francisco, Cal.
Colorado State Medical Society.....	May 25-26, 1904.....	W. D. Blaine, Denver, Colo.....	W. D. Blaine, Denver, Colo.
Connecticut Medical Society.....	May 25-26, 1904.....	New Haven, Conn.....	N. E. Wordin, Bridgeport, Conn.
Delaware, Medical Society of.....	June 14, 1904.....	Lewes, Del.....	J. Palmer, Jr., Wilmington, Del.
District of Columbia, Medical Association of.....	April 5, 1904.....	Washington, D. C.....	D. W. Prentiss, Washington, D. C.
Florida Medical Association.....	April, 1904.....	Live Oak, Fla.....	J. D. Fernandez, Jacksonville, Fla.
Georgia, Medical Association of.....	April 20, 1904.....	Macon, Ga.....	Louis H. Jones, Atlanta, Ga.
Idaho, State Medical Society of.....	October, 1904.....	Idaho.....	Edward E. Maxey, Boise, Idaho.
Illinois State Medical Society.....	May 17-19, 1904.....	Springfield, Ill.....	F. W. W. Ottawa, Ill.
Indiana State Medical Association.....	May 19-20, 1904.....	Indianapolis, Ind.....	F. C. Heath, Indianapolis, Ind.
Indian Territory, Medical Association.....	June, 1904.....	Holdenville, I. T.....	R. J. Crabill, McAlester, I. T.
Kansas Medical Society.....	May 5-7, 1904.....	Topeka, Kansas.....	H. O. Donnell, Ellsworth, Kans.
Kentucky State Medical Society.....	May, 1904.....	Lexington, Ky.....	Steele Bailey, Stanford, Ky.
Louisiana State Medical Society.....	May 3-5, 1904.....	Lafayette, La.....	Andrew G. Friedrichs, New Orleans, La.
Maine Medical Association.....	June 1-3, 1904.....	Portland, Me.....	Charles D. Smith, Portland, Me.
Maryland, Medical and Chirurgical Faculty of.....	April 26-28, 1904.....	Baltimore, Md.....	J. W. Lord, Baltimore, Md.
Massachusetts Medical Society.....	June 7-8, 1904.....	Boston, Mass.....	F. W. Gos, Roxbury, Mass.
Michigan State Medical Society.....	May 25-27, 1904.....	Grand Rapids, Mich.....	A. P. Biddle, Detroit, Mich.
Minnesota State Medical Society.....	May, 1904.....	Minneapolis, Minn.....	Thomas McDavitt, St. Paul, Minn.
Missouri, Medical Association of the State of.....	May, 1904.....	St. Louis, Mo.....	C. N. Nicholson, St. Louis, Mo.
Mississippi State Medical Association.....	May, 1904.....	Greenville, Miss.....	C. H. Trotter, Winona, Miss.
Montana, Medical Association of.....	May 18, 1904.....	Butte, Mont.....	B. C. Brooke, Helena, Mont.
Nebraska State Medical Society.....	May 3-5, 1904.....	Omaha, Neb.....	A. D. Wilkinson, Lincoln, Neb.
New Brunswick Medical Society.....	July, 1903.....	St. Johns, N. B.....	W. L. Ellis, St. John, N. B.
New Hampshire Medical Society.....	May 19-20, 1904.....	Concord, N. H.....	G. P. Conn, Concord, N. H.
New Jersey, Medical Society of.....	June 21-23, 1904.....	Atlantic City, N. J.....	Wm. J. Chandler, South Orange, N. J.
New Mexico Medical Society.....	May, 1904.....	Albuquerque, N. M.....	J. F. McConnell, Las Cruces, N. M.
New York State Medical Society.....	January 26-28, 1904.....	Albany, N. Y.....	Curtis, Albany, N. Y.
New York State Medical Association.....	(To be selected).....	Albany, N. Y.....	G. D. Lumbard, New York City.
North Carolina, Medical Society of the State of.....	June, 1904.....	Hot Springs, N. C.....	J. Howell Way, Wayneville, N. C.
North Dakota State Medical Society.....	June, 1904.....	Bismarck, N. D.....	E. C. Branch, Wheatland, N. D.
Ohio State Medical Society.....	June, 1904.....	Cleveland, Ohio.....	E. M. Foshay, Cleveland, Ohio.
Oklahoma Territory Medical Association.....	June, 1904.....	Cleveland, Ohio.....	P. O. Barker, Guthrie, O. T.
Oregon State Medical Society.....	September, 1904.....	Portland, Ore.....	A. D. Mackenzie, Portland, Ore.
Pennsylvania, Medical Society of the State of.....	September 27-29, 1904.....	Pittsburg, Pa.....	Cyrus L. Stevens, Athens, Pa.
Rhode Island Medical Society.....	June 2, 1904.....	Providence, R. I.....	Samuel A. Welch, Providence, R. I.
South Carolina Medical Association.....	April 13, 1904.....	Darlington, S. C.....	A. B. Knowlton, Columbia, S. C.
South Dakota State Medical Society.....	June, 1904.....	Redfield, S. D.....	J. L. Stewart, Irene, S. D.
Tennessee State Medical Society.....	April 12, 1904.....	Chattanooga, Tenn.....	D. J. Roberts, Nashville, Tenn.
Texas State Medical Association.....	April 26, 1904.....	Austin, Texas.....	H. A. West, Galveston, Texas.
Utah State Medical Society.....	May, 1904.....	Ordgen, Utah.....	George E. Robinson, Provo City, Utah.
Vermont State Medical Society.....	October, 1904.....	Bellows Falls, Vt.....	George H. Gorham, Bellows Falls, Vt.
Virginia, Medical Society of.....	July, 1904.....	Spokane, Wash.....	John F. Winn, Richmond, Va.
Washington State Medical Society.....	July, 1904.....	Spokane, Wash.....	A. H. Coe, Spokane, Wash.
West Virginia State Medical Association.....	May, 1904.....	Fairmont, W. Va.....	W. W. Golden, Elkins, W. Va.
Wisconsin State Medical Society.....	June, 1904.....	Milwaukee, Wis.....	Charles S. Sheldon, Madison, Wis.
Wyoming State Medical Society.....	June, 1904.....	Milwaukee, Wis.....	C. H. Solter, Evanston, Wyo.

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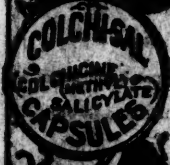
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